MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society

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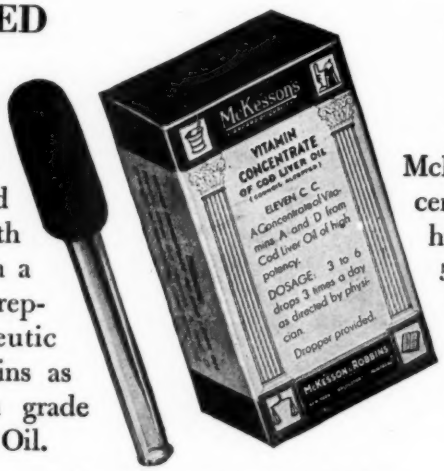
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VOL. XVI JANUARY, 1933 No. 1

PRIMARY CARCINOMA OF THE LUNGS*

EDWIN J. SIMONS, M.D.
Swanville, Minnesota

DESPITE increasing incidence of primary carcinoma of the lungs, it is considered exceedingly rare, according to Fishberg, and is never thought of when an atypical case of pulmonary disease is encountered. Blumgarten states that pulmonary carcinoma is one of the most difficult lesions of the respiratory tract to recognize early. So the purpose of this paper is twofold: (1) to emphasize the increasing frequency of the malady so that it will be borne in mind in the diagnosis of unusual chronic pulmonary conditions; (2) to enumerate some of its salient symptoms which should facilitate early diagnosis.

Incidence.—Foreign literature contains irrefutable proof of the increasing frequency of primary neoplasms of the lung throughout the world. But of more immediate concern is the incidence of the disease in North America, the United States and especially Minnesota. The first significant indication of an increase in the United States appeared as a special report of the Census Bureau in 1914. It attributed 371 of the 52,420 deaths from all carcinomata in that year to cancer of the lungs and pleuræ, an equivalent proportion of 0.7 per cent, or a rate of 0.6 per 100,000 population. These figures refer to the entire registration area.

In 1924 the San Francisco Cancer Survey reported that deaths in this country from cancer of the lungs and pleuræ had increased to 1,586 or a rate of 1.6 per 100,000 population. By 1927 these figures had increased to 2,012 and 1.9 per 100,000, respectively. Hoffman concludes that normal frequency of the disease is less than 2 per 100,000 population and that any figure above that average must be accepted as excessive local frequency. In a tabulation of the mortality due to this disease in the United States and Canada, he then shows that such excessive local frequency has been found in San Francisco, Boston, Buffalo and Winnipeg.

Ewing, in 1922, stated that the lung is the seat of the primary tumor in 1.0 per cent of cancer deaths. Eloesser quoted Rusk and Randolph as having gathered 22 carcinomata of the lungs from the University of California department of pathology since 1916, indicating an incidence of 1.36 per cent of all necropsies. McCrae, Funk and Jackson found at the Jefferson Hospital in Philadelphia, from 1924 to 1927, fifty-three cases of carcinoma in 621 autopsies, of which four were cancers primary in the lungs.

Seventeen cases were reported by Lichty, Wright and Baumgartner, two of which occurred before 1918, two during that year, and thirteen between 1918 and 1926. Symmers at Bellevue Hospital discovered three cases in 5,000 autopsies prior to 1917 and twenty-nine in 6,000 necropsies between 1919 and 1925. Moise found five cases in twenty-nine cancers and 375 consecutive autopsies, showing that cancer of the lungs comprises 1.38 per cent of all postmortem examinations, and 17.0 per cent of carcinomata.

Wells' records from the Cook County Hospital of Chicago cover 403 cancer cases involving thirteen sites. Of these, seventeen, or 4.2 per cent, showed the growth to be primary in the lungs. Fried at the Peter Bent Brigham Hospital did not find a case of the disease between 1913 and 1921, whereas there were five between 1921 and 1925. Moses records that between February 12 and June 1, 1924, three cases of primary carcinoma of the lungs were admitted to the same

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

ward at Kings County Hospital. Rubenstone and Schwartz state that the records of the Mount Sinai Hospital fail to show a case prior to 1918, but show one case in each year 1918, 1919 and 1923, two cases in 1925 and six in 1926.

Most comprehensive of American studies of the incidence of pulmonary carcinomata is that of Rosahn, based on records from the Boston City Hospital. He found that from 1910 to 1928, among 3,004 adult autopsies, there were 314 cancers including twenty-one carcinomata primary in the lungs, an incidence of 0.7 per cent of all necropsies or 6.69 per cent of all carcinomata. His analysis shows that in the period 1925 to 1928, the percentage of all carcinomata in the total autopsies increased 20 per cent—from 10.29 to 12.35 per cent. But he found an even greater increase of pulmonary carcinomata. The percentage of total necropsies found to be carcinomata of the lungs increased 81 per cent—from 0.57 to 1.03 per cent—four times the percentage-increase of all carcinomata. Also, the percentage of pulmonary cancers among all cancers increased from 5.55 to 8.28 per cent, that is 49 per cent. These figures, together with those previously cited showing an actual numerical increase, are to be accepted as proof of an absolute increase.

In Minnesota, Barron's work deserves priority. In 1922 he presented statistics from the pathology department of the University of Minnesota establishing that the incidence increased from a total absence of such cases in 1,333 postmortem examinations during the eleven years from 1899 to 1911 to nine cases in 1,003 necropsies in the two and a half years from 1919 to 1921: an increase in percentage of total autopsies from 0.0 to 0.9. Goltz reported two cases at the Ancker Hospital, St. Paul, between 1912 and 1917 as compared with sixteen from 1918 to 1930. Vinson has reviewed the records of 102 cases seen in Rochester from May, 1925, to January 15, 1932. Of these, seventy occurred prior to 1931, thirty-one during that year, and one during the first half of January, 1932. Thus it is seen that nearly one-half as many cases were encountered in 1931 as during the five and one-half years preceding.

In Canada, Klotz of the University of Toronto collected twenty-four cases from 2,900 postmortem records in the department of pathology. They were divided into two groups, five found between 1910 and 1920, and nineteen in the six succeeding years. He contends that the increase is neither only relative nor apparent, but real, since a review of 1,000 necropsies on adults fifteen years ago revealed a much smaller incidence than has been found in the same number of autopsies in recent years. Hodge obtained the records of ten cases at the Montreal General Hospital during 1918-1928. Nine of them occurred from 1925 to 1928. Boyd found fourteen primary pulmonary carcinomata among the last 900 necropsies performed in the Winnipeg General Hospital—a percentage incidence of 1.5.

To summarize the statistical proof of the increasing incidence of the disease in North America, a tabulation of the figures presented by

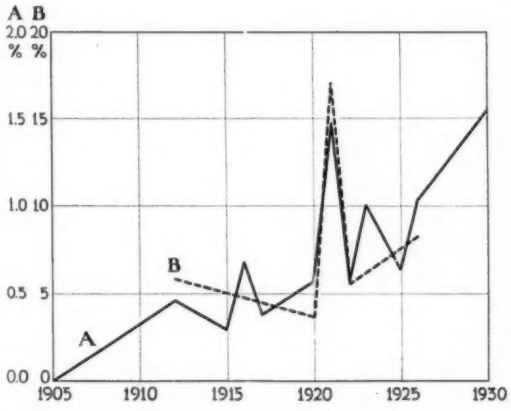
COMPOSITE TABLE OF THE INCIDENCE OF PRIMARY CARCINOMA OF THE LUNG IN THE UNITED STATES AND CANADA

Author	Years	Total Postmortems	Total Cancers	Cancers of Lung	Pulmonary Cancers % of All Autopsies	Pulmonary Cancers % of All Cancers
Barron	1899-1911	1,333		0	0.00	
Klotz (Canada)	1910-1920	1,000		5	0.50	
Rosahn	1910-1914	438	34	2	0.46	5.88
Hueper	1911-1921	5,000		33	0.67	
Barron	1912-1918	2,026		4	0.20	
Rosahn	1915-1919	526	45	2	0.38	4.44
Fried	1915-1925	1,400	136	5	0.35	3.67
Scott and Forman	1916	302		3	0.99	
Grove and Kramer	1917-1924	3,659		21	0.57	
Barron	1919-1921	1,003		9	0.89	
Rosahn	1920-1924	874	90	5	0.57	5.55
Klotz (Canada)	1920-1927	1,900		19	1.00	
Moise	1921	375	29	5	1.38	17.00
Maclachlan	1921	231		4	1.70	
McCrae, Funk and Jackson	1924-1927	621	53	4	0.64	7.54
Rosahn	1925-1928	1,166	145	12	1.03	8.28
Boyd (Canada)	1930	900		14	1.55	
Totals		22,754	532	137	0.60	6.57

eleven authors in the United States and Canada has been compiled. It includes 22,754 necropsies, 532 carcinomata in general, and 137 pulmonary cancers. Despite fluctuations, this table reveals a gradual increase in percentage of pulmonary carcinomata in total autopsies from 0.0 in 1899 to 1.55 in 1930, and a similar increase in the percentage of cancers of the lung among total cancers from 5.88 in 1910 to 1914 to 8.28 in 1925 to 1928.

When these figures are presented graphically, the resultant curves are similar to many of the German incidence-graphs. The graph of the percentage of cancers of the lung in all necropsies, in addition to depicting a gradual increase in incidence, shows also a major fluctuation in 1921. The curve of the percentage of all carcinomata found to be primary pulmonary carcinomata shows a slight general increase and a marked increase in 1921. Since such tabulations and graphs in Germany are conceded to prove an absolute increase of these neoplasms, such a conclusion is justifiable concerning the incidence in North America.

INCIDENCE OF PRIMARY CARCINOMA OF THE LUNGS IN THE UNITED STATES AND CANADA, 1905 TO 1930



A—Continuous line—Percentage of all autopsies that are cancers of lung.
B—Broken line—Percentage of all cancers found to be cancers of lung.

Such facts prove the increase of the disease. Even more impressive is its frequency as compared with that of cancer of other organs. Wells found that pulmonary carcinoma occurs as often as cancer of the breast and liver. Rosahn places it fifth in the sequence of carcinomata of all organs. Lichty, Wright and Baumgartner, and Gruber as well, state that it ranks next in frequency only to cancer of the stomach, breast, uterus and esophagus. In Hamburg in 1923, Kikuth found that carcinoma of the lungs was second among visceral neoplasms, and occurred one-third as often as cancer of the stomach. Realization of these facts leaves little excuse for failure to include it among the diagnostic possibilities of atypical chronic pulmonary conditions.

Diagnosis.—Brief statements as to sex and age incidence will serve as a transition to the more strictly clinical features. In a review of 3,264 cases, it was found that men are more susceptible in the ratio 3.4 to 1. All figures quoted refer only to those cases which have been diagnosed histologically. An analysis of 2,031 cases as to age frequency shows that 666 occurred between the ages of fifty and fifty-nine, 511 from sixty to sixty-nine, and 435 from forty to forty-nine. Thus it is seen that the sixth decade is the one of greatest incidence and that 79.3 per cent of the cases occur between the ages of 40 and 70.

Symptoms of primary cancer of the lungs arranged in the order of frequency have been determined, from an analysis of 1,032 cases, to be as follows: cough, expectoration, pain, dyspnea, pyrexia, emaciation, hemoptysis, dilated chest veins, cyanosis, night sweats, edema, dysphagia, vomiting, hoarseness and clubbed fingers. Since the percentage of correct diagnoses during life varies so greatly, Polevski has stated, the practicing physician must have, if he is to succeed diagnostically, some definite signs or a definitely pathognomonic symptom-complex. Although the symptoms of the malady are variable, it does present individual symptoms or combinations of symptoms which should lead one to suspect its presence.

Fried states that a sharp stabbing pain in the chest due to an early involvement of the pleura is one of the most characteristic symptoms. He emphasizes the point that no other disease, especially tuberculosis, will give such persistent pain with failure to respond to treatment. Pain in the chest is one of the cardinal symptoms of pulmonary neoplasm, and, since pain is exceptional in secondary carcinoma of the lung, when it does occur, it points to a primary cancer of the bron-

chi, lungs or pleuræ. In the parenchymal type of pulmonary cancer, pain is the only early symptom, yet, in the opinion of Paterson, it is not as constant as the blood-cough syndrome of the bronchial type. One author believes that pain is the most frequently elicited complaint, or, at least, it, more than any other symptom, draws attention of the patient to his condition. Haynes and Gaskell contend that, although pain is by no means always present, either severe continuous pain in the absence of pleurisy, or a constant boring pain with indefinite or unusual physical signs suggests pulmonary cancer.

Dyspnea in persons of cancer age, when not due to a valvular lesion, hypertension or emphysema, when combined with cough, pain in the chest and slight hemoptysis, should, Fishberg believes, excite suspicion. Polevski points out that, next to pain, dyspnea is the most frequent complaint that directs patients with pulmonary cancer to a physician. Dyspnea and orthopnea, or "chest oppression," are much more urgent in cases of malignancy of the lungs than in any other condition.

Seyfarth believes it is important when dealing with adults to keep cancer of the lung in mind in the presence of repeated hemoptysis, and another clinician has stated that hemoptysis is as indicative of carcinoma of the lung in an adult as of tuberculosis in a younger person. While the frequency of hemoptysis is uncertain, Hunt states it is commonly enough the result of cancer of the lung to keep such pathology in mind in cases where its cause is obscure. Still others point out that persistence of bloody sputum for weeks and months in an adult points definitely to the diagnosis of pulmonary malignancy.

Packard found in his cases that weakness and exhaustion were the prime reasons for seeking medical aid, and others regard a history of weakness as important in separating benign from malignant pulmonary neoplasms. Development of clubbed fingers in a patient of middle age requires a careful examination of the lungs for tumor.

Combinations of more than two pulmonary symptoms are often sufficient evidence to suggest malignancy of the lung. Bonner contends that even the small, solitary, nodular growth is indicated by pain, dyspnea, expectoration and fever. Persistent and progressive dyspnea, pain and dry cough out of all proportion to the extent of physical signs in the chest should always arouse suspicion of intrathoracic growths. Some believe that rapid loss of weight and strength, pain and dyspnea point to pulmonary malignancy. A recurring cough with pain and dyspnea, accompanied by small amounts of clear or blood-streaked mucus is indicative of bronchial carcinoma, especially when found in a patient of cancer age. Rizer and Habein maintain that when a patient has dyspnea, dull chest pain, hemoptysis and abnormal chest findings, malignancy of the lung should be considered. It is important to think of a pulmonary neoplasm when a patient of cancer age begins to cough and is "short-winded."

Bronchitis or pneumonia as a recent past history, followed by pain, hemoptysis, and dyspnea in a patient of cancer age, particularly with a negative pulmonary history up to that age, are frequently sufficient to justify a tentative diagnosis of primary pulmonary carcinoma. The insidious appearance of cough, blood streaked sputum, low fever, dyspnea, and pain in the chest in a person over thirty-five years of age should suggest not only tuberculosis or cardiovascular disease but also the possibility of neoplasm of the lung. Pain in the chest and dyspnea are found frequently associated with pulmonary carcinoma and seldom in early tuberculosis. Fried and Buckley state that when a middle aged person presents an abrupt onset of symptoms and signs of a rapidly developing intracranial lesion a metastatic cerebral lesion should be thought of, and that the lungs are the most common site of the primary tumor. Rubenstone and Schwartz state that pain, cough, expectoration, dyspnea, hemoptysis and emaciation are sufficiently pathognomonic symptoms to justify a presumptive diagnosis of pulmonary carcinoma. Another helpful diagnostic suggestion is that of Cooper, namely, that one of the most impressive things about his observations of the disease was the mildness of symptoms early in its course and the later prostration out of all proportion to the degree of involvement.

Through an analysis of these statements is reached the consensus of opinion that, in a person more than thirty-five years of age, previously well except for one or more attacks of influenza, bronchitis, or pneumonia within recent years, cough, pain in the chest, dyspnea, hemoptysis and loss of weight or strength are suffi-

cient evidence to justify a diagnosis of probable primary pulmonary carcinoma.

One of the great difficulties in the clinical diagnosis of intrathoracic cancer lies in the fact that the physical findings are variable and not peculiar to this disease. It is Fried's observation that in primary carcinoma of the lungs the physical signs are amazingly scant compared with the amount of tissue involved and the grave character of the lesion. Many other investigators support this view. However, there are physical signs which, when combined with one another or with certain symptoms, should lead one to consider an intrapulmonary new growth among the first diagnostic probabilities.

On inspection, unilateral limitation of expansion is one of the most common signs. If the disease has been present long, the chest is asymmetrical either in dimension or in contour. Also in advanced cases the superficial chest veins may be distended and edema of the chest wall, neck, face or arms may be found. Palpation usually demonstrates decreased tactile fremitus on the diseased side. Davidson says that tenderness is often noted in the intercostal spaces over the growth. An interesting fact noted by Fishberg and Steinbach is that patients having enlarged palpable cervical adenitis due to tuberculosis seldom show signs of active disease in the lung, but when glands are enlarged by metastases from pulmonary malignancy there are extensive lung changes. These glands are usually found by palpation between the heads of the sternocleidomastoid muscles.

Although the physical signs remain unilateral and sharply defined, percussion notes and auscultatory signs change in character from day to day. According to Parish, a change in physical findings from those of atelectasis to bronchiectasis is so typical of a pulmonary neoplasm as to be almost pathognomonic. Pulmonary cancer is urgently suggested when one side of the chest is flat and offers the characteristic resistance to the pleximeter finger from apex to base. Even in those cancers originating in the alveoli, light percussion will show dullness or flatness earlier than has been reported.

When breath sounds may one day be absent over a lobe and the next day heard with râles, bronchial obstruction is denoted and consequently cancer of the lung is suggested. Auscultation will show diminished breath-sounds in pulmonary carcinoma, in contrast to a tuberculous lesion or pneumonia. Simpson says that diminished breath-sounds at the base of the affected lung are often the only sign in an early case. Behier and Adler refer to "cornage" as a sound similar to that heard over the partly compressed trachea but occurring over the lung proper. It is considered by many as pathognomonic of pulmonary malignancy. Except cornage, absence of breath-sounds over one entire hemithorax, if not due to pneumothorax, which is excluded by percussion, is almost invariably due to a tumor of the lung or pleura with effusion.

When cornage is heard near the sternal border or in the upper half of the interscapular space, together with a flat note over the upper lobe of the lung, if no adventitious sounds are audible, it is characteristic of tumor of the lung. Staehelin's view is that a circumscribed area of dullness with decreased breath-sounds and decreased vocal fremitus may indicate almost certainly the diagnosis of pulmonary cancer. While often the earliest physical phenomena are limitation of expansion, dullness or flatness and decreased breath-sounds at one apex or posteriorly at the hilus, this same combination of findings is most pathognomonic of primary carcinoma of the lungs after effusion is ruled out.

Pleural exudates complicate pulmonary carcinoma so frequently that some of the distinguishing features of such effusions must be considered. The effusions of tumors of the lung occur after thirty-five and usually forty-five years of age, while tuberculous pleurisies usually occur at younger ages. Unlike tuberculous and metapneumonic pleurisies, those secondary to malignancy invariably have an insidious onset. Fishberg states that the former are characterized by flatness over the area containing fluid while immediately above the flat area anteriorly is a zone of tympany—the so-called Skodiac resonance. It is this tympanitic zone that is absent above an effusion complicating cancer of the lung. In these the flat note extends above even to the clavicle. Displacement of the mediastinum to the opposite side is common in tuberculous and metapneumonic effusion and is exceptional in cancerous varieties. More often, due to atelectasis, the mediastinum is drawn to the affected side. In pleurisies of tuberculous, rheumatic and metapneumonic origin, breath-sounds are audible over the lung above the effusion, as are

also râles. These are absent in cancerous effusion. Tapping does not relieve pain in cancerous effusions, but does in those of other origin. Reasonable suspicion of the presence of a primary pulmonary tumor is based on the occurrence of a unilateral pleural effusion, with or without bloody fluid, in the absence of definite signs of tuberculosis.

Kikuth, in a high percentage of his cases, found hemorrhagic pleural effusions. De la Camp maintains that it is exceptional in pulmonary carcinoma to find a sanguineous exudate. To the contrary, Staehelin contends that, when a hemorrhagic pleural exudate is found, of the three most frequent causes, tuberculosis, infarction, or carcinoma, the last is the most likely. Supporting this opinion, Goltz states that a hemorrhagic pleural exudate indicates malignancy in practically all chronic cases not associated with trauma.

Repeated sputum examinations should be made as an aid to diagnosis. The presence of tubercle bacilli does not exclude neoplasm. Brunn found tubercle bacilli in the sputum of 10 per cent of 626 cases collected from the literature. Tumor particles found in the sputum give an absolute diagnosis but occur only in exceptional cases.

Improvement in the diagnosis of intrathoracic malignancies is due to the universal use of the X-ray. The typical roentgenogram, as described by several authors, shows in the less frequent lobar or lobular type a solitary round shadow in the lung field, but in the more frequent hilar or bronchial type it shows a unilateral, triangular, central shadow involving the whole hilum and usually located at the sixth to eighth rib posteriorly. This roughly triangular shadow usually possesses an infiltrating border with strand-like processes invading the pulmonary tissue. Some observers state that in the early stages it is significant to find a shadow occupying the greater part of one lung with light coming through the apex and the costo-phrenic angle.

In conjunction with fluoroscopy and roentgenography, the intrabronchial injection of iodized oil, and artificial pneumothorax are helpful diagnostic procedures. Biopsy of supraclavicular glands, thoracoscopy and exploratory thoracotomy also are indispensable in diagnosing pulmonary cancer. Jackson asserts that complete diagnosis without the bronchoscope is not possible unless the X-ray is positive. Brunn believes bronchoscopy is the most valuable adjuvant in diagnosis. One German authority is even more emphatic when he says that the bronchoscope is the only aid from which improvement in diagnosis in the early stages can be expected.

To obtain earlier and more frequently accurate diagnoses, Staehelin advocates that carcinoma of the lung be considered: (1) when pleurisy will not heal and especially when the exudate is hemorrhagic; (2) when gradual symptoms of bronchial stenosis or a space-limiting process in the thoracic cavity occurs; (3) when hemoptysis appears without other cause; (4) when cachexia accompanies seemingly harmless symptoms; (5) when chest-pain is present without other etiology; (6) when there is found an unexplained disease of the respiratory organs especially in tuberculosis suspects when tubercle bacilli can not be demonstrated.

FRACTURE WORK IN THE SMALL COMMUNITY*

B. J. Branton, M.D., F.A.C.S.
Willmar, Minnesota

TWENTY-FIVE years of medical practice in the same community is filled with many successes which well overcome the too many disappointments. Especially is this true in fracture work.

During this quarter of a century we have seen the results of the excellent work of education in tuberculosis. Bone and gland tuberculosis are becoming practically unknown. The propaganda for early eradication of pre-cancerous conditions has made the public as well as the doctor cancer minded.

Has the same education been directed towards fractures—their care and end-results? Do the laity as well as the criticising over-zealous doctor

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 24, 1932.

still need enlightenment with regard to the reasons for the end-results?

I believe both groups need education and that when fractures are viewed in the light of their occurring in human beings made up of flesh and blood—not mere pieces of wood and steel—subject to all the different ills that human bodies are heir to, then and not till then will we get the cooperation from our patients and their friends which we are entitled to in this work.

Various national surgical societies have entered the field of education along this line. It is my hope and trust that their work will be of such scope that it will bear abundant fruit, first with the profession and through them with the public.

In rural communities the facilities for fracture care are not so abundant but the gray matter which a recent speaker said was the first essential in fracture treatment is present and must be used if we are to succeed. Common sense may well be added to gray matter to attain success.

Sound principles of treatment must go hand in hand with anatomic knowledge and the mechanics of levers must be studied thoroughly no matter what type of splint or apparatus the surgeon may elect to use.

In the country districts transportation is a problem: a careful driver and a good mattress are essentials. In the armamentarium of the physician, Thomas splints both for fractures of the arm and leg with knowledge of their application will usually make the patient comfortable during a journey of any distance.

I have seen patients after a ride of many miles in an automobile, with fractures which would have been simple of reduction if seen at the place of the accident. The injured member has become swollen, the deformity exaggerated, the tissues lacerated and reduction almost impossible, all of which a simple splint of boards and a pillow would have prevented.

Many fractures which are simple in the beginning, if handled roughly before splinting, may become aggravated or even compound in careless hands. We should therefore teach gentleness in their handling and remember the axiom: "Splint them where they lie."

The automobile, gasoline tractor and other modern power-equipped machinery have brought with their use fractures which I may call unclassical. Textbooks do not contain descriptions of them. Therefore each fracture must be considered as an individual problem and treatment carried out accordingly. Standardize treatment if you will, but individualize you must in most fractures.

One must always remember that no matter what the extent of the fracture, the soft parts about it are injured. Naturally the more serious the fracture of the bone, the greater the damage to the surrounding tissues. We should impress this truth most forcibly on the minds of the injured individual.

Every doctor and hospital should have available an X-ray machine of some type competently operated. X-ray plates should be taken frequently and read correctly.

The X-ray, a wonderful instrument of percision when its product is viewed by those expert in its use, becomes many times a destroyer of confidence when this same product is seen through the eyes of the uninitiated laity—facts being distorted to the individual's wish. Education here again is needed.

Reduction should be accomplished as soon as possible, remembering that the earlier the reduction, the easier it is accomplished, the less the amount of injury to the soft parts and the quicker the healing.

If an X-ray machine is available plates should be obtained before reduction, but too much time should not be lost before reduction is made. Plates should always be made at once after treatment and at frequent intervals until healing has taken place. This will give untold relief from worry and add to one's peace of mind.

Extreme care and gentleness are essential in manipulation for diagnosis. If pain is marked, do not attempt to elicit crepitus; wait rather for an X-ray.

Splints of many shapes and sizes are made available by the manufacturers but one must not be carried away by clever salesmanship to the point of investing in unusable apparatus. Many things advocated today, like the books of yesterday, will become obsolete tomorrow. A splint should be selected for a case only after diagnosis; do not fit the diagnosis to the splint at hand.

A man endowed with a mechanical turn of mind and ordinary ingenuity can devise with the aid of a blacksmith and harness-maker most of the necessary equipment in the way of splints. A carpenter will supply with his tools and a few pieces of lumber a satisfactory Balkan or other

frame—the hardware store supplying him with pulleys and rope. The product may not look so well but will give the same results. In these times of lessened incomes it is not looks but results we are after and one cannot be censored for using rather homely equipment.

Plaster casts, so necessary in many cases, can easily be made from dental plaster or plaster bandages purchased in sealed containers ready for use. Several widths should be available.

In the treatment of fractures one should be frank with himself. He should write adequate daily records though it does seem irksome at times, and see the patient more often even than the patient may think necessary, thus oftentimes protecting himself from future censure.

Pain in the fractured part should be studied with care as it is the beacon light of trouble in the form of pressure, swelling, deformity, infection and the unusual complications. A fracture properly reduced is not ordinarily painful to any great degree.

Nervous, complaining individuals should be handled with care. Consultation more frequently used will still unnecessary fears.

Blood Wassermann tests should always be taken. Many a poor result and lengthened convalesence are due to the earlier worshiping of Bacchus and kindred gods.

In the seven years (1925 to 1931 inclusive) 1,188 cases have been X-rayed at our hospital as potential fractures. Twenty-six (plus) per cent of these have proven to be frank fractures. Approximately 5 per cent of these have been reduced by open operation, the remainder having been treated by the closed method.

Open operation has been necessary because of inability to hold the fragments satisfactorily in position in compound or severely comminuted fractures or where interposition of soft parts renders this impossible. It has been resorted to in the hope of obtaining a better functional result. Closed reduction has always been tried first in ali but the compound fractures.

Foreign material such as screws, nails, plates and wire, has been used as little as possible in open reduction because it has been found that in the great majority of cases the position is well maintained through the complementary pull of the muscles after the fractured ends are put in correct position and the part is encased in splints or casts.

THE EQUIPMENT NECESSARY FOR THE FIRST AID TREATMENT OF FRACTURES*

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Minneapolis

FRACTURES are on the increase throughout the world and Minnesota is no exception. Just as it is necessary to establish a Minnesota Highway Patrol Organization because of the increase of travel throughout our state so is it necessary to provide for the results of the hazards of travel and although Minnesota is not the first to apply the fracture campaign to its highway patrolmen, to my knowledge Minnesota has, as usual, "placed" in this respect in the race to give its citizens the best of medical care.

Cancer and tuberculosis problems have been taken up by lay organizations and the benefits derived from the more general application of the known truths resulting from these lay efforts are thoroughly appreciated by all thinking citizens.

The fracture program which has been carried on during the past fifteen or more years is beginning to show results. Our soldiers in France fourteen years ago were taught the proper application of first aid in fractures. They also demonstrated that they were able to learn first aid for fractures. I recall overhearing one of the enlisted men working on my surgical team in France while transferring his duty of holding a broken lower extremity to another enlisted man say to the second man, "Now hold him carefully because if you don't, it will cause shock." I am sure that our enlisted men who were taught the

*Part of the First-Aid Clinic for Minnesota Highway Patrolmen presented at the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

first aid care of fractures fourteen and fifteen years ago are still very useful citizens in the presence of a fracture injury.

The Boy Scout organization is carrying on this educational program and the knowledge of the average boy scout who comes up for his First Aid Merit Badge again shows that this subject can be taught successfully to non-medical people. In fact, the subject is so elementary that medical school teachers have sometimes neglected to teach their studentts the principles of first aid in fractures.

Not long ago I saw a boy with both thigh bones fractured who had been placed in an automobile and carried forty miles to a hospital without first aid splints. I saw another patient with a fractured femur who had been transported without splinting in an automobile fifteen miles across country from one hospital to another which possesses an X-ray apparatus and the patient was X-rayed and again placed in the automobile and carried fifteen miles back to the first hospital for continuation of his treatment. Let us hope that both trips were made on our beautiful Minnesota paved roads.

The Boy Scouts who have completed their first aid training and are applying for their merit badges possess a very complete knowledge of first aid for fractured bones. They know of the danger of permitting the fractured ends of the bone to penetrate the skin and cause a compound fracture. They are familiar with the use of boards and other available material for making temporary splints. I have been a first aid merit badge examiner for the boy scouts during the past ten years and I have been astonished to find that nine out of ten of these boys know that splints should go beyond the joints at each end of the broken bone and should be well bandaged to these parts beyond the joints. Many of them know that if the splint does not go beyond the joint above the fracture that, in order to be of value, the splints would have to be bound too tightly and would act as a tourniquet.

Doctor William Darrach, formerly Dean of Columbia University Medical School, in the Oration on Fractures presented in October, 1931, before the American College of Surgeons, said:

"The injuries resulting from fractures are not limited to those occurring at the time of the accident. Unwise attempts to use the injured extremity may cause or increase displacement of fragments, increase the laceration of soft parts, and perhaps lead to penetration of the skin by ends of bones. The same additional trauma is often due to the awkard efforts of the bystander. A man is struck by an automobile and his leg is broken. Except for the broken bone, without displacement, the original injury may be merely slight periosteal tear and mild contusion of soft parts, but he is helped to his feet and the leg gives way, the fragments slide by each other, thus stripping off the periosteum and tearing the muscles. He falls to the ground only to be picked up and carried to the sidewalk with the leg dangling. Larger blood vessels are torn, the bone end comes through the fascia, perhaps the skin, even the trousers. He is laid at rest with a coat beneath his head and surrounded by people anxious to help. Someone sees his leg is crooked and straightens it out. The exposed bone end re-enters the wound with a bit of trouser and the dirt of the street. Again, he is lifted up and carried to a car or ambulance. This time, someone carries the injured leg with better intentions than coördination and the ends of the bones are churned around in their bed of lacerated tissues and the contaminating organisms well disseminated throughout the area. During his ride, and in the transfer to the accident ward or the doctor's office, unless he has been carefully splinted, there is more jolting and more damage. Would that his troubles were over but too often the sad story continues. Lack of sufficient protection as he is lifted to and from the X-ray table and as he is being anesthetized, examinations which are too rough or extensive, or repeated, result in still more injury.

"Compare this exaggerated picture with a similarly injured man who is allowed to remain where he is until a proper splint can be applied, or at least can have someone pull hard on his foot as he is being lifted and carried, whose examination is thoroughly but gently carried out, and whose treatment is instituted with but little additional injury. The difference in these two cases as regards time of disability and amount of permanent functional disturbance is tremendous."

At the Boston Conference on the Treatment of Fractures in April, 1922, a syllabus was prepared and under First Aid the following directions were given:

Every effort should be made to avoid any injury additional to that of the original trauma.

1. "Splint 'em where they lie!"
2. Avoid any unnecessary manipulation.
3. Transport with extreme care.
4. Treat any existing shock.

The American Medical Association in 1926 appointed a Coöperative Committee on Fractures and the published work of this Committee is known as the Primer on Fractures. For first aid to fractures they have listed the following splints and accessories for the doctor's automobile:

One Thomas leg splint half ring.

One Thomas arm splint, half ring.

One half dozen basswood splints, two and one-half inches wide.

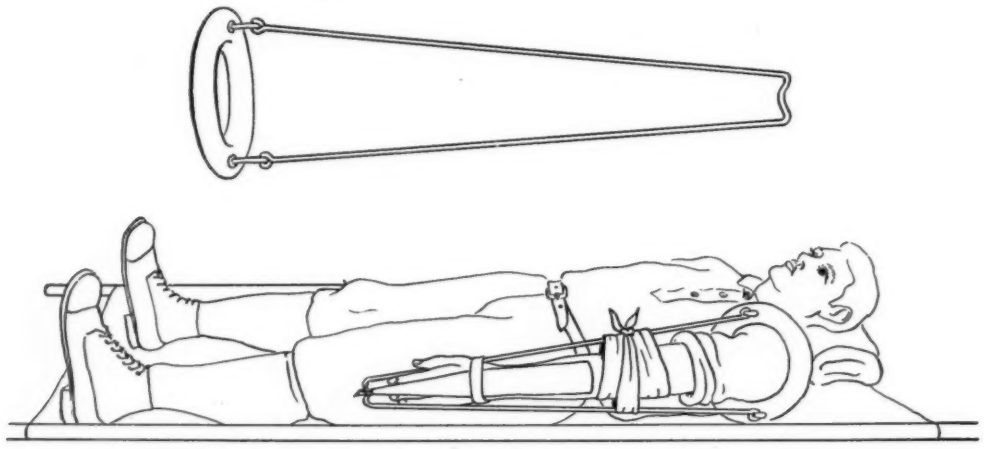

Fig. 1. Thomas-Murray hinged splint for upper extremity fractures. Note slings to arm, traction on forearm, elbow extended. Whole upper extremity at side of body. Injured arm ready for transportation, guarded and protected.

Fig. 2. Indicating the use of the Keller-Blake splint for transportation and first treatment of fracture of the leg and thigh. Note elevation of lower extremity, slings, traction. Note the half ring which lies under the thigh against the tuberosity of the ischium and the strap and buckle over the thigh anteriorly to hold the half ring snugly in place.

One tourniquet.

One half-pound can of ether.

Six muslin bandages, two inches and three inches in width.

One small roll of adhesive tape.

One package of safety pins.

The American College of Surgeons established a Commitee on the Treatment of Fractures ten years ago under the chairmanship of Doctor Charles L. Scudder. The "Principles and Outline of Fracture Treatment" published by this committee in the March, 1931, Bulletin of the College of Surgeons stresses the importance of First Aid. As a result of the efforts of the sub-committee on Ambulance Equipment for First Aid in Fractures, of which Dr. Robert H. Kennedy of New York is chairman, the second edition of this outline will contain the result of their work, which is as follows:

An ambulance should carry the Thomas-Murray hinged arm splint and the Kellar-Blake hinged half-ring splint with web strap and buckle. In addition there should be a box containing all the other necessities for first aid in frac-

tures. The contents will vary according to the method of application used. One typical box is equipped as follows:

1. 9 heavy muslin hammocks, 6″ x 18″.
2. 9 metal clips (used commercially as paper clips and known as Acco Clamps No. 325).
3. 2 portions of cotton sheet wadding, 6″ x 6 yards, folded to 16″ lengths.
4. 8 muslin bandages, 3″ x 36″.
5. 8 wooden tongue depressors.
6. 4 strips of adhesive. 1″ x 16″.
7. 8 thicknesses of 1/16″ basswood splint, over one of which the strips of adhesive (No. 6) are placed.
8. 4 strands of 16 ply clothes line, two, 2 feet long; the other two, 3 feet.
9. ½ roll absorbent cotton, Grade B.
10. ½ pound extra clothes line, 16 ply.
11. 4 3″ gauze bandages.
12. Roll of 2″ adhesive.
13. 1 bandage scissors.
14. Sterile gauze for compound fractures.

CONCLUSIONS

The practical application of proper first aid treatment equipment by our enlisted soldiers was proven possible in the late war.

First aid in fractures is being successfully taught by the Boy Scout organization.

Every ambulance operating in Minnesota should carry a standard set of splints and equipment for proper first aid treatment of fractures.

All hospitals should possess similar splints for purposes of exchange with the ambulance when patients are brought in wearing these splints.

The excellent body of men making up the Minnesota Highway Patrol Organization should be given individual practical instruction in the application of proper first aid equipment to fractures and it would be an advantage to those injured on our highways if the patrolmen carried proper splints in their automobiles.

Every physician in general practice throughout Minnesota should have in his office the equivalent of the above outlined ambulance equipment for emergency use if located where properly equipped ambulances are not available.

SUBDIAPHRAGMATIC ABSCESS AND LIVER ABSCESS*

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IT is my purpose to present some of the more important facts relating to subdiaphragmatic and liver abscesses as obtained from a short survey of the literature. A case representative of each condition will also be reported.

Barlow of England in 1845 and Leydon of Germany in 1886 were the first to describe the clinical picture of subdiaphragmatic or subphrenic abscess and distinguish it from thoracic abscess. In 1880 surgery was first attempted to relieve this condition.

Anatomy.—The subdiaphragmatic or subphrenic space may be divided for purposes of description in various ways.

For practical purposes a subdiaphragmatic space may be defined as any cavity having the diaphragm as one of its walls. It is located in the space between the liver and the diaphragm, which is subdivided into an anterior and a posterior space by the coronary ligaments and further by the lateral ligaments into right and left anterior and posterior spaces.

Abscesses in the anterior space give rise mainly to intra-abdominal symptoms, while abscesses in the posterior space give rise mainly to thoracic symptoms.

Frcquency.—It is difficult to arrive at a very accurate estimate of the frequency of subdiaphragmatic abscesses. John D. Weaver reported subdiaphragmatic abscesses occurring twenty times in a series of 2,400 cases of appendicitis operated by himself. This condition occurs at any age, but mostly from the ages of twenty to thirty, males being more susceptible than females in the proportion of four to one.

Etiology and Pathology.—Lance in 1909 an-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

alyzed 1,000 cases of subdiaphragmatic abscess to determine its etiology and reported as follows: 20 per cent caused by appendicitis, 30 per cent by stomach and duodenal lesions, 13 per cent by lesions of the liver and gallbladder, and the remaining 37 per cent by miscellaneous diseases of the pancreas, spleen, large intestine, pleura, etc.

Wayne Babcock states that 33 per cent of all subdiaphragmatic abscesses are caused by rupture of a gastric or duodenal ulcer; 16 per cent by appendicitis; 16 per cent by liver disease; and the balance from various causes including trauma to the abdomen.

Del Valle and Malbran state that 30 to 35 per cent of subdiaphragmatic abscesses are caused by peritonitis following appendicitis, and 20 per cent by peritonitis the result of gastric ulcer.

The infection arrives at its subdiaphragmatic site in one of four ways: (1) by the peritoneal route; either by direct extension from an infection in an organ which is adjacent to the diaphragm, or by intraperitoneal transmission as from an appendiceal infection traveling up the right lumbar gutter to the right subdiaphragmatic space; (2) by the extraperitoneal fascial planes, as from a retrocecal appendiceal infection progressing upward posterior to the ascending colon, which, according to Blake, is the cause of 50 per cent of the right sided subdiaphragmatic abscesses; (3) by a pylephlebitis from a mesenteric vein extending into the portal vein and resulting in an abscess on the surface of the liver with a later perforation into the subdiaphragmatic space; (4) by extension of infection along the lymphatics of the deep epigastric artery.

Esengraff found the intraperitoneal route involved in two-thirds of 106 cases of subdiaphragmatic abscess studied. This is readily explained by the tendency of appendiceal infections to drain intraperitoneally either upward along the right lumbar gutter and therefore to the right subdiaphragmatic space or downward to the bottom of the pelvis.

According to various authorities the subdiaphragmatic abscesses complicating appendicitis are multiple in over 50 per cent of the cases.

According to Gruneisen, pleural complications occur in 60 per cent of right sided subdiaphragmatic abscesses. The pleurisy may be fibrinous, serous or purulent. Occasionally the abscess may perforate the diaphragm and form an empyema. Taking the subdiaphragmatic abscesses as a whole, the pleura is unaffected in 67 per cent according to Perutz and 78 per cent according to Piquands.

Symptoms and Physical Findings.—Whenever symptoms of right lower thoracic disease or upper abdominal disease appear following acute or chronic abdominal infection one should suspect subdiaphragmatic abscess. The patient is septic, has pain in the upper abdomen, often with hiccough, nausea and vomiting. If the abscess involves the posterior space pain often radiates to or is had in the right shoulder area. The patient has chills and profuse sweating with irregular fever. There is usually cough and often pain in the right lower chest of a pleuritic character.

These symptoms may begin a few days or several weeks after an appendectomy. In about one to two weeks from the onset of a subdiaphragmatic abscess it has developed to such an extent that a diagnosis can be made.

Examination will usually show limitation of excursion of the right lower chest. Local tenderness is often present over the lower chest or subcostal region. This becomes more definite and remains localized as the process develops. Also slight edema of the skin may develop in the same tender area.

There is often dullness over the base of the right lung, due either to an accompanying pleural effusion or the elevation of the diaphragm from the abscess beneath it. The liver may likewise be displaced downward. Occasionally a pleuritic friction sound is heard over the base of the right lung and often moist râles are present.

If the abscess is in the anterior space and "points" inferiorly a tender swelling may be demonstrable at the costal margin.

The fluoroscope and X-ray film are valuable in these cases and show an elevation or "doming" of the right diaphragm with limitation of excursion on the involved side. If the abscess is on the left side the diaphragm will show less elevation but the physical findings will be similar with perhaps an increase of the gastric symptoms.

Treatment.—Aspiration should only be used as part of the actual operative procedure.

According to Grove and others, incidence of subdiaphragmatic abscesses can be much decreased by longer and more thorough drainage of appendiceal abscesses. Occasionally a lumbar stab wound may facilitate better drainage. The

half-sitting and abdominal postures postoperatively are also important prophylactic measures.

If the subdiaphragmatic abscess is found anteriorly, an incision may be made parallel with the costal margin and the abscess carefully mopped out after walling off the general abdominal cavity. Tube drains inserted should be removed fractionally, pulling them out a little each day over a long period of time.

If the abscess is in the posterior subdiaphragmatic space, or its location not definitely known, the retroperitoneal technic suggested and used by Nather and E. W. Ochsner is very advisable. An oblique incision is made over the twelfth rib, which is resected subperiosteally. The muscles are divided transversely at the level of the first lumbar spine. By blunt dissection, the renal fascia is exposed and followed upward where it becomes continuous with the peritoneum on the diaphragm. The peritoneum, which is edematous over the abscess, is bluntly separated from the diaphragm. Aspiration may be used at this stage to check for both supra- and infrahepatic abscesses, which combination is present in 50 per cent of the subdiaphragmatic abscesses complicating appendicitis, according to Nather and Ochsner. The abscess is opened bluntly, large drains being placed and left for an ample period.

It is not advisable to use transpleural drainage since the pleura is sterile in about 75 per cent of the cases. If the transpleural method of drainage is used the pleura will become infected in 30 to 35 per cent of the cases.

Prognosis.—If not operated upon, 80 to 90 per cent of patients with subdiaphragmatic abscess will die, only a few recovering by rupture of the abscess into a hollow abdominal viscus or into a bronchus.

The operative mortality is 20 to 30 per cent according to Blake, but this may be reduced by early operation. Gatewood reports 30 per cent mortality in forty-one cases from the Presbyterian Hospital, Chicago. Choyce states that early operation results in a mortality of 30 to 40 per cent. Delayed operation may result in new loculi and a recurrence of fever and sepsis.

Fig. 1 (Case 1). Right subdiaphragmatic abscess (October 19, 1927).

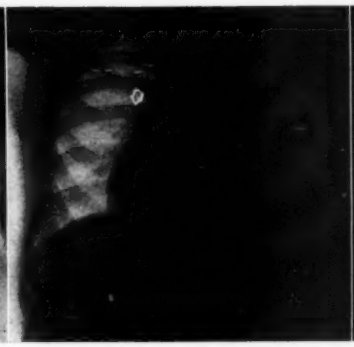

Fig. 2 (Case 1). Right subdiaphragmatic postoperative pleural thickening (October 26, 1927).

Fig. 3 (Case 2). Liver abscess (March 23, 1932).

CASE REPORT

Case 1.—O. E., a farmer, thirty-four years of age, gave a fairly typical ten year history of duodenal ulcer and had been under medical treatment intermittently.

He developed a very acute appendicitis and was promptly operated upon October 2, 1927, the abdomen being closed without drainage, since no free pus was present.

The patient did not do well postoperatively, his temperature varying from 100 to 103 degrees. On October 7, he raised some bloody sputum, had pleuritic pains in the right lower axilla, and showed dullness and absence of breath sounds at the right lung base with medium moist râles but no bronchial breathing.

On October 15, the patient began to have occasional emesis daily. Fluoroscopic and X-ray examination on October 19 showed doming of the right diaphragm with limited excursion. The white blood count had gradually increased to 19,000. By October 20 a tender swelling at the right costal margin lateral to the gallbladder was noted.

At operation, October 21, an oblique incision was made below the costal margin and the free abdominal cavity entered. Exploration was negative except for a subdiaphragmatic abscess in the right posterior and anterior subdiaphragmatic space. This was bluntly opened

after amply protecting the general peritoneal cavity. The wound was closed with ample drainage. The patient made an uneventful recovery and the wound was entirely healed in seven weeks. Physical and X-ray findings of a thickened pleura persisted for several weeks after the operation.

Since Dr. Collins presented a very fine paper on liver abscess before the Tuesday General Section I shall limit my remarks to a few differential points and the presentation of a case.

Liver abscesses are mainly of two types—amebic and pyogenic. The amebic type responds very well to emetine given hypodermically either with or without drainage and has a mortality of 5 per cent according to Wilmoth. Chatterji reported a 2 per cent mortality in 186 cases treated by emetine hypodermically and aspiration.

Pyogenic or bacterial liver abscesses are usually multiple and have nearly a 100 per cent mortality. A liver abscess may be secondary to any septic process but is often secondary to appendicitis. The symptoms are very similar to those produced by a subdiaphragmatic abscess, but offer fewer localizing signs. A mild jaundice is usually present.

The source of the infection in the case we report is indefinite. A moderately severe type of infectious jaundice was epidemic at this time in our section of Minnesota and we had personally seen about 100 cases. Fairly typical influenza was also prevalent at about the same time.

Case 2.—D. L., a farmer, fifty-six years of age, born in Belgium, had always been well until two months before he was seen in consultation, January 19, 1932. He gave a history of severe chills, fever, profuse sweating, general body aches and pains two months previous. After a few days, nausea and vomiting appeared. He had improved after one week, was up and about, and then gradually became weaker. He had become bloated and constipated, developed a hiccough with occasional vomiting, a septic type of fever (normal to 104.5 degrees) and some cough.

The only significant findings on examination were moderate bloating and some moist râles at the right base.

On February 8, the patient became moderately jaundiced. This did not entirely subside during the balance of his illness. Septic fever, nausea and vomiting continued. On February 17, the white blood count was 47,000 and varied from 20,000 to 30,000 for the duration of the illness. The urine showed traces of albumin, sugar, and bile, and a few leukocytes and red blood cells at nearly every examination. X-ray films and fluoroscopic examination on February 18 were negative. The diaphragm moved equally well on the right and left sides. From February 21 to March 23 the patient received six transfusions of citrated blood because of his anemia and sepsis. The clotting time was 13.5 minutes and the blood calcium was 2 mgm. per 100 c.c. of blood. Under parathormone and calcium gluconate intramuscularly the clotting time and blood calcium returned to normal. Insulin was required to bring the blood sugar down from 250 plus to near normal.

Following these measures the patient's general appearance was much improved. The jaundice lessened, the appetitie increased and there was less nausea and vomiting. The septic course continued with chills and temperature varying greatly, from 95.6 to 105.8 degrees (rectal) on one occasion within a period of ten hours. Still the patient had no complaints except chills and occasional nausea and vomiting. He had no cough and no pain. Examination showed a dullness in the right axilla to the fourth intercostal space with moist râles at the lung base. The liver was now palpable at the right costal margin on deep inspiration and was slightly tender. X-ray and fluoroscopic examination showed a doming with a limitation of the excursion of the right diaphragm. A tentative diagnosis of liver abscess was made.

On March 24, operation was carried out under novocaine field block and a small amount of ether by inhalation. The spleen was found to be twice its normal size. The stomach, duodenum, gallbladder, appendix, and pelvis were normal. The liver was normal in color and consistency with a few adhesions over the upper right lobe. An area of induration three inches in diameter with central fluctuation in the right upper lobe was aspirated and a heavy greyish yellow pus was obtained. The anterior portions of the seventh and eighth ribs on the right were removed subperiosteally and the underlying tissues sutured to the diaphragm and the abdominal cavity well packed off. The electric cautery was used to open into the abscess cavity of about 60 c.c. capacity. The liver wound was packed with gauze and hemorrhage was slight. The abdominal wound was closed with adequate drainage.

The patient appeared much improved for three days but septic temperature recurred and the patient died eight days postoperatively. Post-mortem was refused but we feel that multiple liver abscesses were the cause of death.

GRADUAL DECOMPRESSION OF THE BILIARY SYSTEM*

THE MECHANICAL FACTOR IN POST-OPERATIVE HEMORRHAGE AND HEPATIC INSUFFICIENCY IN JAUNDICED PATIENTS

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Saint Paul

THE surgical management of patients suffering from obstructive jaundice has been the subject of numerous discussions and papers during the past ten years. Walters has enumerated the three chief sources of danger in these patients as follows: (1) hemorrhage, (2) uremia, (3) hepatic insufficiency. As a result of his work it is now well established that the coagulation time of the blood in jaundice is increased, and that this can be reduced by intravenous injections of calcium chloride given before operation and that post-operative hemorrhage is thereby diminished. Hepatic insufficiency, although present to a more or less degree in all jaundiced patients, is frequently exacerbated following any surgical procedure and this usually occurs some time in the first ten post-operative days, and it practically always results fatally.

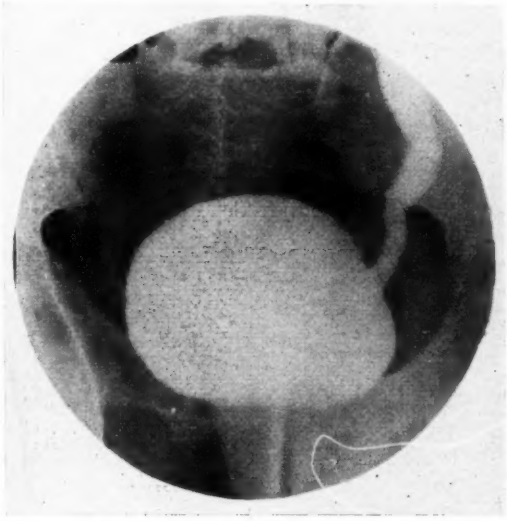

Fig. 1. Cystogram of a patient with complete retention of urine due to prostatic hypertrophy, showing bilateral ureteral reflux due to back pressure.

Although intravenous calcium chloride is a great aid to the safe conduct of jaundiced patients, it is apparently far from being a panacea in the removal of the associated danger. In spite of its use we still have post-operative hemorrhage and we still have exacerbations of hepatic insufficiency. In other words there are other factors present which result in post-operative hemorrhage and hepatic insufficiency.

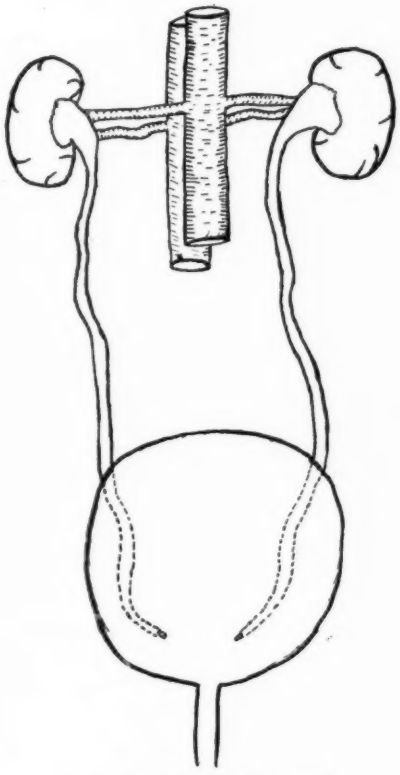

Fig. 2. Schematic sketch of the urinary tract showing distended bladder, ureters, and renal pelves—and the blood supply to the kidneys.

Evarts Graham has lowered the mortality from operations on the biliary system by determining the degree of hepatic insufficiency with the use of various dye retention tests. His work

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 25, 1932.

has established that co-existing liver damage is present even in cases where one would think from clinical examination that no damage could have been done to the liver. He has come to the conclusion that phenotetraiodophthalein is the most reliable dye test and that intravenous injection is the method of choice for cholecystography or for a test of liver function. If over 60 per cent of the dye is retained in the blood stream after one hour, or in other words if the liver is damaged to the point where it cannot eliminate

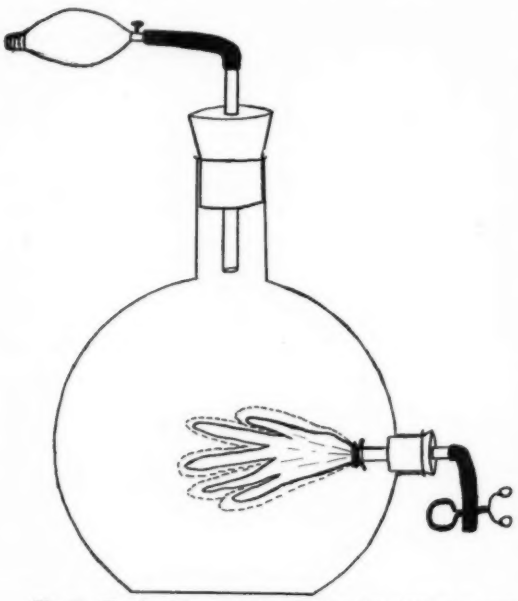

Fig. 3. Sketch of an apparatus showing that changes in pressure of one system can affect the size, shape and pressure of a second system incorporated in the first.

50 or 60 per cent or over in one hour, he believes such patients are poor surgical risks and should be placed on a medical regime until their dye retention is reduced to 30 or 40 per cent. In his hands and in the hands of his co-workers the mortality from surgery on the biliary system has been reduced from over 6 per cent to 0.4 per cent.

However, other surgeons have not been able to approximate his low mortality, particularly in jaundiced patients when hepatic insufficiency is usually the greatest. However, Graham has added immeasurably to the safety of patients who must undergo operations on the biliary system. He attributes the reduction in mortality to the fact that surgeons are now becoming

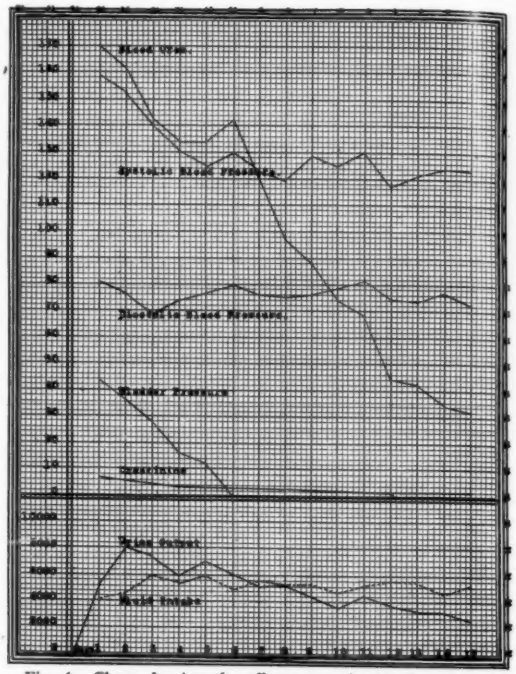

Fig. 4. Chart showing the effect upon the blood urea, creatinine, blood pressure in a patient with urinary retention due to prostatic hypertrophy when the bladder is gradually decompressed successfully.

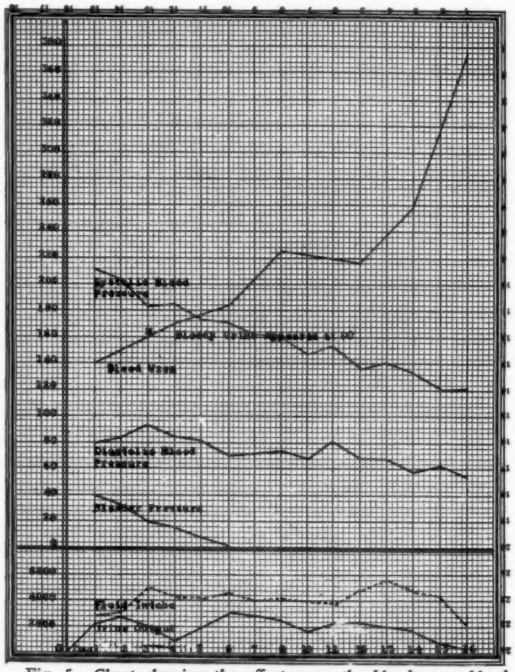

Fig. 5. Chart showing the effect upon the blood urea, blood pressure, and the appearance of hematuria in a patient with urinary retention due to prostatic hypertrophy when the bladder is gradually decompressed unsuccessfully.

"physiologically minded" in approaching their problems.

There is one factor which to my mind has been overlooked in considering a surgical problem of the biliary system and it also is in the realm of physiology in its application to the functioning of the liver. I refer to the disturbances which may result in an organ by the sudden changing of the existing pressure and I shall endeavor to demonstrate the physical action which results when this pressure is suddenly disturbed.

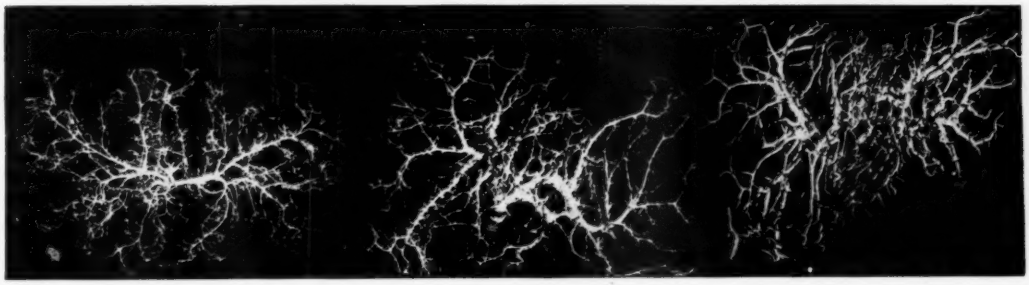

Fig. 6. Normal corrosion preparation of biliary tree (after Counseller and McIndoe).

Fig. 7. Result of intermittent obstruction of the common bile-duct by Stone (after Counseller and McIndoe). Note the extreme dilatation.

Fig. 8. Benign stricture of the common bile-duct (after Counseller and McIndoe). Note the extreme dilatation.

An analogy may be drawn between obstruction in the biliary tract and obstruction in the urinary tract. A patient with prostatic hypertrophy has urinary retention with secondary back pressure on the ureters and kidneys. Sudden release of this pressure by catheter or suprapubic drainage results frequently in hematuria and sometimes in anuria. Van Zwallenburg in 1920 proved that this hematuria was caused by numerous punctate hemorrhages in the renal pelvis. The physiology of this phenomenon may be explained as follows: the kidney has gradually been forced to perform its function against a steadily increasing intra-pelvic pressure (Fig. 1). In order to accomplish this the blood supply to the kidney and the blood pressure increase. A swollen, tense kidney results. Then the bladder is suddenly drained and the intra-pelvic pressure is released. When this occurs the intra-renal capillaries suddenly enlarge because of the increased blood pressure and the decreased intra-pelvic pressure. If their distensibility is not very great they rupture and hemorrhage results (Fig. 2).

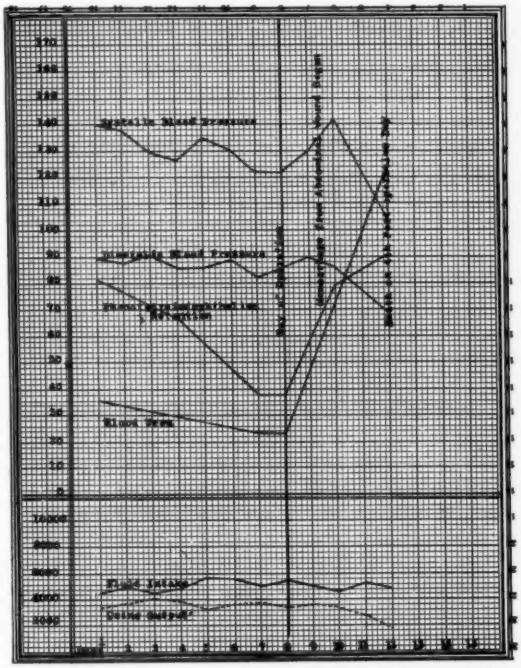

Fig. 9. Chart showing the effect upon the liver function, blood urea and blood pressure and the point of appearance of abdominal hemorrhage in a jaundiced patient after removal of a stone from the common duct and altering the intrabiliary pressure.

That changes in pressure in a closed system will result in changes in pressure in a system incorporated in it, can easily be demonstrated by a simple apparatus (Fig. 3). If we suddenly release the air from the outer compressed air chamber the air in the balloon has less pressure to work against and it suddenly enlarges and assumes the size indicated by the dotted line. Now let us assume that the large container is a kidney with increased intra-pelvic

pressure and that the balloon is its vascular system. If we suddenly release the intra-pelvic pressure, we increase the size of the vascular system. The pressure suddenly is decreased on the and McIndoe beautifully demonstrated this in their celloidin-injected livers after the hepatic tissue had been removed by corrosion. The biliary tree is analogous to the ureters and renal

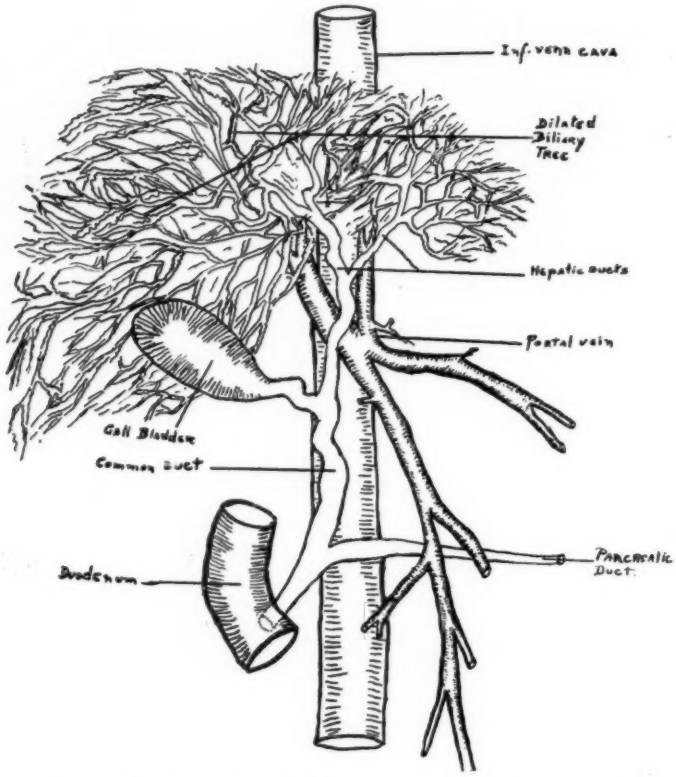

Fig. 10. Schematic sketch of the biliary tree and portal vein showing the interrelationship between the two systems.

outside of the membrane and the balloon (the blood vessels) enlarges. If the distensibility of the blood vessel walls is not sufficient, rupture and hemorrhage results and this engorgement if extreme may result in a total urinary suppression. To combat this, gradual decompression of the urinary tract was advocated by Van Zwallenburg (Figs. 4 and 5).

Somewhat the same condition prevails in the biliary system of patients with obstructive jaundice. Increased intrabiliary pressure is present not only in the gallbladder and in the common and hepatic ducts but it also extends into the biliary tree and is therefore present throughout the entire liver (Figs. 6, 7 and 8). Counseller

pelves; the portal system is analogous to the vascular system in the kidneys.

Just as hemorrhage from the renal pelvis occurs after the release of intra-pelvic pressure, it was argued that rupture of the vessels of the portal system may follow the sudden release of intra-biliary pressure (Fig. 9). Walters has shown that downward displacement of the liver causes a marked disturbance in the portal vascular system which is evident by a marked fall in blood pressure. He accomplished this by inserting a rubber glove between the liver and the diaphragm and distending it with air. If it is possible to obtain a marked disturbance in the blood pressure by merely displacing the liver by

extrahepatic pressure, it should be reasonable to expect a much greater disturbance by a sudden mechanical release in pressure throughout the biliary tree. Reasoning from this premise it seems logical to suggest gradual decompression of the biliary tree in an attempt to give the portal system a chance to adjust itself to the different pressure (Fig. 10).

I regret that I have not a large series of cases to prove my theory has definite clinical value but in offering it for what it is worth I can report that no demonstrable post-operative hemorrhage or hepatic insufficiency resulted since this method was employed, and I offer this in the hope that other surgeons may be prevailed upon to try to decompress the biliary system and thereby supplement my meager data in an effort to determine how much if any clinical value it possesses.

The method is simple and adds no risk to operation on the biliary system. When an incision is made into the distended biliary system, an attempt is made to lose as little bile as possible. I use rubber covered clamps on the hepatic ducts where it is feasible and open the gallbladder or common duct below that point. Then when the obstruction is removed, a clamped tube is inserted for drainage and sutured as snugly as possible in an attempt to prevent any leakage. The rubber covered clamp is then removed. The wound is closed and the patient returned to bed with the tube still clamped. Where it is not feasible to use a rubber covered clamp, we insert the tube into the common duct, losing as little bile as possible. The clamp on the tube is loosened at half hour intervals allowing from six to ten c.c. of bile to escape, and it is then clamped again. This procedure is carried out over a period of four days when the clamp is removed and not reapplied. In this manner the pressure in the dilated biliary tree is not suddenly released, and the liver has an opportunity to readjust itself gradually to its new pressure and no sudden enlargement of the capillaries of the portal system will result which might cause rupture and engorgement. I feel this procedure should be one more factor in reducing post-operative hemorrhage and an increase in hepatic insufficiency.

ANAL FISTULAS*

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THE term "anal fistula" is used to designate a discharging sinus or sinuses, with one or more openings in the anal canal and an opening or openings either on the external surface of the body or in an adjacent viscus, such as the vagina, bladder, urethra, uterus, prostate gland, seminal vesicles, or the bowel itself. The anus is usually the primary seat of the disease, and from the original infection in one or more of the anal crypts, the disease progresses through various stages to the formation of the fistula. It has been customary to refer to the openings of fistulas as internal and external. I would urge that this classification be discarded, and that the terms primary and secondary be used instead. Although the primary opening is always internal, the secondary opening is not always external. The latter usually appears on the external surface of the body in the region of the anus, but often the abscess ruptures into the bowel, bladder, vagina, and so forth, and at such times it would be better to refer to the point of rupture as a secondary opening.

ETIOLOGY

It is advisable to remember that the primary opening will usually be found in an anal crypt because during examination there is a tendency to pass the margin where the crypts are situated, and to look too high for the origin of the disorder. One of the chief reasons for failure to cure anal fistulas is this misconception.

It has usually been taught that the primary cause of anal fistula is an abscess in the ischiorectal tissues. It is true that this abscess is an important part of the process that develops into

*From the Section on Proctology, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, St. Paul, May 23 to 25, 1932.

a fistula, but it is by no means the primary cause. When the abscess forms it is often responsible for the chief symptoms which attract the patient's attention to the development of the fistula. Soreness, a sense of fullness, tenderness, or some other sensation of discomfort about the anus or the lower part of the rectum might have been noted, but these are usually too insignificant to cause any impression. The surgeon, therefore, usually has no opportunity to investigate the conditions which are responsible for the development of the fistula until after the abscess appears. It does not seem necessary to regard seriously such unusual causes of ischiorectal abscess or fistula as tuberculosis, actinomycosis, and so forth. Actinomycosis occurs so rarely that it is almost a pathologic curiosity, and it is probable that tuberculosis may be found associated with anal fistulas in about 9 or 10 per cent of cases; even then, however, the associated tuberculous condition can be considered as the cause of the fistula in scarcely more than 2 or 3 per cent of cases. It was once thought that all anal fistulas were caused by tuberculous invasion of the ischiorectal tissue; few now have this idea.

PATHOLOGY

There are four stages in the development of anal fistulas. The first stage begins with involvement of the anal crypts. These little pockets are surrounded by lymphoid tissue, and are formed at the juncture of the skin with the mucous membrane, at the inner margin of the anus. These crypts are susceptible to all traumatic influences which attack the rectal outlet. Anything which produces a break in the tissues about the anal crypts, with subsequent admission of such organisms as colon bacilli, Proteus vulgaris, staphylococci, streptococci, and so forth, may result in infection of these crypts, and from this, in turn, fistulas may develop. The infected crypt becomes edematous, the papilla becomes inflamed and adherent over the crypt, and this point of infection is the beginning of the fistula.

The second stage is a process of burrowing. The infection in the crypt begins to expand, and with its spread it extends into the tissue adjacent to the anus. There are several courses which these tracts may pursue, but most of them burrow either through the substance of the external sphincter muscle, or internal to it, between it and the internal sphincter. It ultimately finds its way into the ischiorectal tissues, where the abscess develops.

The third stage occurs when the ischiorectal abscess develops. After the infection passes through or between the muscles, the irritation produces a spastic condition, and, except in cases in which there is great destruction of muscle fiber, this spasm prevents return flow of the pus toward the anus. Consequently, there is an accumulation external to the muscle and the abscess develops in the loose tissues of the buttocks, the ischiorectal spaces, or the pelvis.

In the fourth stage, the abscess increases in size and may rupture either externally, on the cutaneous surface, or into one or more of the pelvic viscera. With the appearance of the secondary opening, regardless of its situation or manner of development, the fistula is complete. The supposed incomplete, external fistula is an impossibility. Such a condition implies absence of a primary opening, and the very nature of the disease precludes such a possibility. There are times when the surgeon, being unable to find the primary opening, believes that there is none, but this opinion is erroneous. All anal fistulas have primary openings.

Occasionally a tract will burrow from its source under the pectinate line, between the anal muscles, and upward under the rectal wall, forming an abscess which adheres to, and ultimately ruptures into, the rectum. This tract may also extend externally into the buttocks and rupture through the skin. In such a case one is easily misled, because when the probe is inserted into the secondary (external) opening, it may pass through the high rectal sinus; likewise, when methylene blue, barium, or other solutions are injected, the colored material appears in the rectum above the anal crypts. Unless the true origin of the infection is understood, one may make the error of regarding the high sinus as the starting point of the fistula.

Occasionally the virulence of the infection is responsible for excessive destruction of the muscle fibers as the burrowing continues. As a result the muscle spasm may be overcome also, and the pus is able to escape by returning along the tract and is discharged into the anal canal at the portal of entry of the infection. In such a case there is often no rupture externally, and consequently the fistula is not completed. The

result is a blind sinus, the so-called "blind internal fistula."

TREATMENT

The patient usually does not consult a physician until after the abscess has formed, and frequently not until after it has ruptured. If induration without fluctuation is present, hot applications and such measures as are necessary to bring the abscess to a "head" should be used, after which it should be opened. Some patients may be extremely ill with high fever, and it is difficult to decide whether to continue treatment to hasten the process of localization or to operate. Generally the abscess should be allowed to point close under the surface of the skin, if possible. The process may find its way into the pelvis, but it is better to incise through the buttocks than to open the abscess through the wall of the rectum, even if the incision must go through several centimeters of normal tissue. The incision should be made in such a manner as to leave the secondary opening as large, if possible, as the cavity of the abscess. The use of the cautery is rarely necessary for fistulectomy and tuberculous fistulas heal just as readily, even though the cautery is not used. Digital exploration should not be done except with the utmost care. Irrigation of the cavity with solutions should be avoided. Either of these maneuvers may result in destruction of the pyogenic wall of the abscess and systemic reaction may prove serious. It is best to put in an iodoform gauze drain after the operation is completed and do nothing more. Before performing fistulectomy the cavity of the abscess should be permitted to heal until it is reduced in size, and only a chronic fistulous tract remains. If the abscess is small, complete excision, including the anal crypt, may be possible. Usually, however, the abscess should be taken care of first and the fistula later.

Preparation of the patient for operation is essentially the same as that which has been described for other rectal operations. A small retention enema of oil is given the evening before the operation and cleansing enemas are given in the morning. No laxatives or cathartics are used, and the patient is restricted to liquid diet for supper and breakfast before operation. Sacral or caudal anesthesia is preferable because, aside from painlessness, what is most desired is relaxation of the anal sphincter without distortion of the parts, and these types of anesthesia accomplish both. The operation is performed with the patient in the prone position, the pelvis being elevated on a transverse bar attached to the table.

Operation.—The operation is begun by dilating the anus to a diameter of 4 to 5 cm. After examination of the fistulous tracts has been completed, the anus is incompetent due to anesthesia, and remains open after withdrawal of the dilating finger. Then, by simply retracting the buttocks forcibly, the pectinate line can be seen and the crypts explored without difficulty. There may be more than one primary opening, and there may be more than one secondary opening, but there is usually one on the inside which is the source of the infection and is responsible for the fistula. This opening is usually in one of the anal crypts, and when there is another opening in the rectum, it will be found above the pectinate line some place in the wall of the rectum, due to rupture of the abscess at that point. Fistulous tracts follow irregular courses, and there is constant risk of forcing the probe into normal tissue through the angular walls of these tracts if fistulas are probed from the outside toward the bowel. I do not inject colored solutions. It seems unnecessary to use this means of distinguishing the characteristic changes in tissue.

It is easy to discover the primary opening by examination of the crypts themselves. It is possible to judge with fair accuracy where the primary opening will probably be by noting the position of the secondary opening. A simple rule will assist in determining the course of the tract. If one imagines a straight line drawn between the tuberosities of the ischia it will pass across the anus near its anterior margin. If the secondary sinus is anterior to this line, the primary opening will probably be in the anterior half of the anus, and a straight fistulous tract will connect the two openings. If the secondary opening is posterior to this line, the primary opening is usually found in the posterior median line of the anal canal, and the fistulous tract will pass from it in a curved course. If there are multiple openings, and sinuses are found anterior and posterior to this imaginary line, the external sinuses are usually connected by tracts, and the rule for the posterior opening applies. About 50 per cent of the primary openings will be found

in the crypt or crypts situated in the median line of the posterior anal wall; about 20 per cent are in the median line of the anterior anal wall, and about 30 per cent are in the right or left walls. If the anal canal is divided into anterior and posterior halves, approximately 70 per cent of fistulas will be found to have originated in diseased crypts of the posterior half.

There is usually a definite sinus inside which can be seen without difficulty. Frequently pus can be seen coming from behind the pectinate line. Sometimes a tuft of granulation tissue can be seen within a crypt, and occasionally only a little inflammatory reaction, with bleeding on slight trauma, designates the position of the primary opening. Many times surgeons are perplexed because of the apparent absence of a primary opening. When the abscess has formed and ruptured, release of pressure and establishment of a point of discharge make it theoretically possible for the tract extending from the anus to the abscess to heal and become fibrous. The tract may shrink and actually become obliterated. In this way the crypt could close completely. This is probably the explanation of the "incomplete external fistulas" described by surgeons who have been unable to demonstrate a primary opening. When the primary opening is found, one should perform the operation from this point outwardly, cutting through the fibers of the anal sphincters external to the tract, and carrying the incision down through the wall of the fistula. Rarely will it be necessary to begin division of the tract externally, with a probe or a grooved director in the external sinus. All fistulous tracts should be opened throughout their length and all overhanging edges thoroughly cut away. The tracts should be excised unless they extend into the pelvis, or so deeply into the ischiorectal spaces that excision cannot be accomplished without sacrificing too much tissue. When the tracts cannot be excised they may be scarified so that they will heal with a solid scar. If there should be a sinus extending into the pelvis, not communicating with the bowel above the anus, it will probably heal if left alone, provided that the process of infection is interrupted by completely uncovering or excising the tract connected with the anus. Then the infective discharge from the rectum passes outside, and can no longer accumulate in the tunnelled fistula. The source of infective material is isolated from the tract, and the subsidary tract, which was not excised, is allowed to heal. If possible, all fistulas should be opened. If the sinus is connected with an opening high in the rectum the surgeon should cut through the rectal wall, through the entire course of the sinus and leave the wound open. Only superficial tracts should be sutured, and then not so close to the anus that there will be pockets and overhanging edges near the anal margin. It is rarely necessary in treating fistulas to operate in stages, except when there are hidden tracts which cannot be discovered at the first operation. Leaving iodoform gauze or other forms of packing in place too long is often responsible for loss of muscular control. The walls of the wound ultimately become a fibrous membrane beneath the dressing under such circumstances, and a cavernous scar results. The anal sphincters cannot close the rectal outlet by exerting their pull on the margins of such a membranous scar. The scar must be solid. The gauze should be removed early, while the walls of the wound are still raw. The edges will then come together with healing and form a solid block of scar tissue throughout. The anal muscles grow to this scar and will close the outlet of the rectum just as if the muscle fibers were not interrupted.

In cases in which the condition is complicated by tuberculosis, treatment of anal fistulas should be surgical, even if the pulmonary lesion is severe. The patient should be relieved of the additional physical burden by performance of a suitable operation.

PRESENT-DAY SURGICAL TREATMENT OF CARCINOMA OF THE RECTUM AND RECTOSIGMOID*

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THERE is no problem with regard to diagnosis of carcinoma of the rectum since even a cursory digital examination invariably reveals the lesion. Carcinoma of the rectosigmoid, however, because of its anatomic situation occasionally is palpated with difficulty by the examining finger; always it may be recognized by proctoscopic examination.

I would emphasize the difference between carcinoma of the rectum and carcinoma of the rectosigmoid because of the necessity of adopting different measures for their surgical eradication. The rectosigmoid juncture is an annular portion of the intestine corresponding with the anatomic situation at which the peritoneum which lines the abdominal cavity is reflected off the rectum. Surgically, it is proper in reality to consider the last 5 or 6 cm. of the terminal sigmoid, and the upper 5 or 6 cm. of the extraperitoneal rectum as the rectosigmoid. This portion unfortunately is, as the old axiom goes, "too high to get at satisfactorily from below, and too low to get at satisfactorily from above," and yet, actually, it harbors two-thirds of the so-called carcinomas of the rectum.

In an effort to localize accurately growths of the rectum and rectosigmoid, because of the belief that they were not all of a piece but presented different clinical and operative problems, I located the growth in 100 consecutive cases, according to its position in the rectum, at the rectosigmoid, or in the anal canal and found that sixty-seven were in the rectosigmoid, as I have designated its surgical limitations; twenty-one were in the rectum proper, and two were in the anal canal. The significance of such localization is easily understood when it is recognized that the rectosigmoid is a semifixed point; that there is usually a rather sharp angulation as the sigmoid enters the rectum, and that the arrangement of the musculature at this point acts similarly to that of a weak sphincter muscle. The result of these anatomic factors is that with a carcinoma at this point, encroaching as it does on the lumen in an encircling way, obstruction in some form is a predominant symptom. Secondarily, because of the difference in the lymphatic distribution and drainage of this portion of the gastro-intestinal tract, entirely different types of surgical procedures, more radical, it is true, are essential to satisfactory extirpation than those lower in the rectum.

Unquestionably, one of the greatest advances in dealing with carcinoma of the rectum, from a surgical standpoint, has been the recognition of the lymphatic drainage of this portion, as established by Miles, and the application of extensive operative procedures to carcinoma in this situation, dependent on the well-recognized principle of radical extirpation of the offending growth and the glands and gland-bearing tissues in its immediate vicinity. The lymphatic drainage, as Miles has emphasized, which is both intramural and extramural and divides further the zone of upward extension, the zone of lateral extension, and the zone of downward extension, is so different when the growth is high in the rectum, as against that in the anal canal, that indications for surgical procedures differ. For instance, the growths in the anal canal have a tendency to metastasize forward into the groin, whereas those higher metastasize toward the mesentery of the sigmoid and through lymphatic anastomosis involve the nodes in the ischiorectal fossa, in the base of the broad ligaments, and around the base of the prostate gland. That rectal and rectosigmoid carcinomas may be thought of as entirely different in type, both symptomatically and surgically, seems to me necessary.

The diagnosis of carcinoma of the rectum or rectosigmoid revolves around three significant symptoms which, I think, normally are indicative of the growth in its earlier stages, and are, in order of their importance: change in bowel habit, bleeding, and pain. I make this notation of the symptoms of carcinoma in this situation in order

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to point out that carcinoma is usually so easily recognized that it should be recognized here just as easily, and in as early a stage as carcinomas of the breast or of the lip, or if mild symptoms, not pathognomonic, but directed to the point in question, demand a careful examination. Certainly, the 20 per cent of patients who present themselves for treatment of carcinoma of the rectum or rectosigmoid, and who have been operated on for hemorrhoids within the period of their symptoms without recognition of the underlying condition, would argue strongly in favor of more accurate examinations.

Change in bowel habit is not as easily explained as perhaps it should be, since normal bowel habits vary in different persons and it is difficult frequently on direct examination to elicit information on this point. It is not unusual for patients to answer that their bowel habit is normal when, in reality, they are passing three, five or even more stools a day. I believe that an excessive number of stools a day, or alternating periods of constipation and diarrhea, should be considered as abnormal, and call for a rigid examination of the lower part of the alimentary tract.

Bleeding is perhaps the chief complaint of patients suffering from carcinoma of the rectum or rectosigmoid. Forty per cent of the patients with carcinoma of the rectum or rectosigmoid coming to The Mayo Clinic complain of bleeding, and a similar percentage complain of pelvic pain. Bleeding cannot occur until the mucous membrane of the bowel is invaded, nor can the length of time the symptoms have persisted be evaluated accurately because it is indisputable that the growth has been present, in many instances, for a long time without producing symptoms. In my experience the average patient with carcinoma of the rectum or rectosigmoid has been aware of some of the characteristic symptoms for approximately eleven months prior to seeking advice. The sluggishness and the tendency to somnolence of the growth in such cases is significant in prognosis, and the further fact that they are of relatively low or only of average malignancy (according to Broders' grading), lessens their tendency to invade the glands and metastasize distantly and influences prognosis favorably following radical extirpation. Miles has estimated that it requires six months for the carcinoma of average malignancy of the rectum or colon to traverse a fourth the distance around its circumference, and that about the same time is required for lateral extension to affect the mucosa or muscular layers. Blood, when mixed with the stool or on the stool, is perhaps the most constant symptom of disease of the lower part of the bowel or rectum. It certainly is one of the manifestations and, as a premonitory signal, should call for complete examination of the parts. If blood is present for a number of consecutive days or weeks it should be considered as due to a malignant lesion, until it is proved otherwise. Investigation following prolongation of even slight symptoms by proctoscopic or digital examination of the rectum, will direct attention to many of these growths and prevent many of the tragedies which result from procrastination.

All growths of the rectum may be palpated, but growths of the rectosigmoid are not so easily felt. However, if the patient is placed in the knee-chest position, and is required to strain, the growth will usually be pushed down so that the tip of the examining finger may feel its lower edge. If patients are women the growth may often be palpated satisfactorily through the vagina. There are so few lesions which may be confused with carcinoma of the rectum or rectosigmoid that there is little excuse for error in diagnosis. Tuberculosis of the rectum is often spoken of although, as a matter of fact, tuberculosis is one of the rarest lesions observed in the rectum and is easily distinguishable by its local appearance and by distant association with tuberculosis. Syphilis of the rectum need be given small consideration in its distinction from carcinoma, although syphilitic strictures unquestionably occur. Occasionally it is necessary to differentiate chronic ulcerative colitis but this is done both by proctoscopy and roentgenology. The characteristic appearance of the solitary, ulcerating, infiltrating, fixed lesion of the rectum, or the more common polypoid cauliflower-like, pedunculated growth, does not as a rule require biopsy for accurate diagnosis. I believe, however, from the standpoint of prognosis and selection of cases that biopsy should be practiced as a routine. It should be done with a sharp cutting instrument and the wound promptly cauterized. In this manner there is little danger of propagating carcinoma cells to distant organs; it is of prognostic rather than of diagnostic value. I emphasize again that the diagnosis of carcinomas

of the rectum and rectosigmoid should be made by digital and proctoscopic examination. It is such a simple matter for the trained proctologist to view the intraluminal portion of the bowel up to the middle of the sigmoid that I believe all lesions below this point should be diagnosed in this manner. Roentgenologic examination beyond the middle of the sigmoid is invaluable, but the resulting interpretation of lesions of the rectosigmoid and rectum leaves much to be desired.

THE RELATIONSHIP OF POLYPS TO CARCINOMA OF THE RECTUM

To speculate on the possible etiologic factors involved in carcinoma is always intriguing. The accuracy of such speculation is invariably questionable. However, that there is a direct association between polyps, which are so common in the colon and lower part of the rectum, and definite malignant change, is, I believe, indisputable. The accessibility of polyps of the rectum and their recognition in the colon by roentgenologic examination has stimulated their closer study in The Mayo Clinic in recent years with a view to attempting to establish some relationship between benignancy and malignancy in this region. Polyps are eight or more times as common in the colon and rectosigmoid as in the large bowel, and carcinoma occurs in about the same proportion.

Recently, FitzGibbon and I studied a series of cases of carcinoma in which we demonstrated, at least to our own satisfaction, the sequence of events through which a benign polyp passed into malignant adenocarcinoma. This work parallels that of Hauser, Schmiden, Westhaus and Wechselmann, and the criteria by which the gradations were established, likewise were almost identical with theirs; that is, inflammatory polyps were excluded and only the type was included which is normally found in the colon and rectum. These polyps were classified into three groups, according to their structural changes.

In group 1, the epithelium retained its normal characteristics and there was little if any tendency to malignant change. The polyps were small, varying from 1 mm. to 1 or 3 cm. on cross section. Characteristic pedunculations were present even in their smallest caliber.

In group 2, the polyps were easily distinguishable by abrupt and striking structural changes in both the epithelium and in the connective tissue. The epithelium was characterized by widespread failure of the cells to differentiate into normal intestinal mucosa. The hypertrophy and the elongation of these cells, together with their bulk, made them appear to be compressed from side to side, and their arrangement in numerous places digressed from the normal single row into buds which projected both into the lumen and into the connective tissue matrix. The nuclei were likewise elongated and took stains more deeply than is usual, and the amount of nucleus in the cell protoplasm was decidedly diminished. The nuclei developed to a distinct stalk, apparently the result of the pull of the tumor, responding to the peristaltic action. The rapidity of the formation of the stalk influenced the connective tissue elements differently. If the growth was rapid, they spread out into tree-like masses, becoming pedunculated and frequently massive. Occasionally, if the growth was very rapid, they were sessile, and their edges were overhanging. Evidence of inflammation almost invariably was present. In these polyps, unquestionably, malignant changes developed in many instances.

In group 3 the polyps differed from those of group 2 only in that they formed more rapidly, were less pedunculated, and were likely to undergo malignancy of a higher degree. The distinction in groups 2 and 3 is not sharp, as between groups 1 and 2; the rate of development of the polyp, perhaps, is the deciding factor in the grouping of these two. Polyps of group 3 must start in the overgrowth of glandular tubules in the mucosa. They are small, flat and sessile. In development the connective tissue stroma lags behind the epithelial activity and from these polyps come the deep-seated destructive carcinomas of the colon. Although I would not commit myself to the view of certain observers, that every carcinoma of the colon or rectum develops from these preëxisting polyps, I believe that a great many of them do. In the polyps I have studied, in which definite adenocarcinoma was found associated with or dependent on the polyps, I felt that the relationship was indisputable. It is true that a carcinoma may be of the polypoid type without coming from a polyp, as occasionally is seen, but undoubtedly there is a definite association here. As additional evidence of the close relationship of polyps and carcinomas, one need only study a series of cases of polyposis or polypoidosis to be more thoroughly

convinced. In the presence of this entity, in which the formation of polyps is widespread, and there are so many hundreds of them in the colon that little normal mucous membrane remains, it is recognized that about 40 per cent of the patients die from carcinoma. This familial group, perhaps, is one of the soundest arguments in favor of development of carcinoma from polyps and in the presence of polyps, but granting that this is true, the character of the underlying, initiating factor is a moot question.

TREATMENT

The choice of treatment for carcinoma of the rectum and rectosigmoid at the present time is radical extirpation in all cases in which the growth is movable or has not metastasized to other viscera, especially the liver. Radium also has a certain field of usefulness. The selection of cases for irradiation, however, is too uncertain at present to warrant its practice as a routine in operable cases. That better understanding of its utility, either alone or in combination with surgery, will promote better end-results is earnestly to be desired. The radiosensitivity of growths of the rectum and rectosigmoid seems to me to be the crux of the situation and accurate knowledge of this is not available. Radium can be ideally applied to carcinomas of the rectum and to certain carcinomas of the rectosigmoid, and if a firmer knowledge of the radiosensitive growths is established, undoubtedly the end-results will be better. I have the feeling that tumors of high grade malignancy are more radiosensitive than others, and that those of low grade malignancy are distinctly more favorable for surgical extirpation. For epitheliomas of the anus, radium rather than radical operation is employed, but for the treatment of most carcinomas of the rectum and rectosigmoid, I heartily agree with Gordon-Watson, who has treated with radium in the last year more than 200 patients with malignant growths of the rectum. He stated: "I am satisfied that with our present knowledge, the results of treatment are too uncertain to justify the use of radium as a routine measure in preference to radical surgery in those cases in which there is a reasonable prospect of successful radical surgery. It is a tempting proposition to remove an early rectal growth with the aid of radium, to leave an intact rectum with normal function, and to avoid a colostomy. We can attack the tongue in this way and be confident of a cure in a large percentage of cases, but we cannot control or stop lymphatic spread without the aid of surgery in most instances." This seems to me to be a most logical view. I feel strongly that when a patient with a carcinoma in any portion of the alimentary tract applies for treatment, he should be given the benefit of the most radical measures possible for its eradication, whether or not these measures involve a mutilating operation and loss of certain physiologic functions. Since a radical operation on the rectum or rectosigmoid is only possible by sacrifice of the wonderful sphincteric apparatus which nature has contrived, I believe that the greatest single forward step in the treatment of carcinoma in this situation has been the acceptance of permanent colostomy as a preliminary step in radical excision. One greatly desires and is frequently tempted in many cases to make an effort to save the sphincter by a temporizing procedure, but even a cursory examination of one's own statistics three, five or ten years following such operations, will disclose a huge number of recurrences and a small group of living patients, and one will thus be deterred from a very wide application of such principles.

In operating on carcinoma of the rectum, I believe one should have at least four measures at his command: (1) a one-stage combined abdominoperineal resection; (2) a two-stage combined abdominoperineal resection; (3) colostomy and posterior resection, and (4) local excision or segmental excision with preservation of the sphincter, or destruction of the growth by cautery or diathermy, as a palliative measure. Removal of the glands and gland-bearing tissues will be accomplished radically in a high percentage of cases by only the first two types of operations, and yet, in the selection of operative maneuvers, even the boldest surgeon will find that the application of a one-stage combined abdominoperineal resection as a routine measure will greatly reduce his operability statistics. Although in most of these cases in the clinic, colostomy and posterior resection is still performed. I have found it possible to extend the combined abdominoperineal type of operation very widely by making of it a two-stage maneuver. I am convinced that this is the operation of choice when its applicability is feasible.

Operability has such wide range that what may

be considered an operative case by one surgeon may be considered inoperable by another, but I believe that in all cases in which there is no metastasis to the liver and in which the growths are not fixed to adjacent tissues or other viscera, in the absence of extremely grave and debilitating coexisting conditions, patients should be subjected to extirpation, even with the possibility of a relatively high mortality rate. By doing the operation in two stages and prolonging the time between colostomy and resection, the advantages of rehabilitation and decompression are increased materially.

The first stage consists of colostomy and exploration. The latter, I believe, is more satisfactorily made through a low median line incision which permits exploration of the abdomen from above downward; the liver, the nodes along the aorta, and those in the bifurcation of the iliac vessels are explored first and the growth last. It is difficult to overestimate the importance of not handling the infected growth until at the end of the exploration, and then manipulating it as gently as possible to determine its mobility and fixation. The colonic stoma should be made through a small stab wound in the left groin; the single-barreled stoma, which means division of the bowel with inversion of the lower segment and its return to the peritoneal cavity, is the most satisfactory. There are two factors which materially influence the comfort and control of a colonic stoma. One is herniation around the colostomy wound and the other is the prolapse of the mucous membrane. Both of these may be avoided. Herniation is avoided by making a small stab wound. I am convinced that almost invariably hernias follow colonic stomas which are made in the right rectus incision, and not infrequently, in split muscle incisions, if there is pressure from an outside appliance.

The bowel is explored through a low median line incision and is pulled down until a fixed point in the sigmoid is reached; here it is divided and the upper end is pulled out through a small stab wound which is no larger than absolutely necessary to bring the colon through. Sutures are not placed in the colon. It has been my experience that this is the most desirable and satisfactory type of colostomy, and that the patients experience a great degree of comfort.

The second stage of the operation is carried out after four to six weeks, and is as radical as is possible; the segment of bowel, the nodes and node-bearing tissues below the colonic stoma are removed. It has been my practice to mobilize the rectum from behind in this stage, freeing it up to the peritoneal fold, then encasing it in a rubber glove, and dropping it back into the hollow of the sacrum and closing the wound. This is done under sacral anesthesia. Following this the patient is turned on his back, the median line incision is opened again, the ureters are identified on both sides, the inferior mesenteric vessels are ligated, the pelvic peritoneum is incised, and the entire segment of bowel is lifted out through the abdomen. A new diaphragm is made of peritoneum; if the patient is a female, the broad ligaments and uterus may be satisfactorily utilized in the preparation. The wound is closed and drainage is provided posteriorly by removal of some sutures and putting in a small pack to control whatever oozing is present.

My experience with this maneuver has been eminently satisfactory from the standpoint of immediate mortality, and without too closely contracting the horizon of operability it has been possible to operate in a large number of cases with a mortality of between 9 and 10 per cent. The first series of consecutive cases in which I attempted this operation numbered twenty-three before there was an operative death. Although I recognize that this type of maneuver must not be applied as a routine, I believe that with increasing experience and with earlier diagnosis it may be done in perhaps two-thirds or three-fourths of the cases, with a mortality rate of 10 per cent, and without contracting the operability rate, which ranges from 50 to 58 per cent, varying a little in different years.

PROGNOSIS

The outlook for longevity following successful resection of the rectum or rectosigmoid by radical surgical measures is influenced by both extrinsic and intrinsic factors. Extrinsic factors may be grouped under such general terms as physical condition of the patient, and duration of the lesion, and they are modified by such various local conditions as situation, size, mobility, hyalinization, fibrosis and metastasis. Probably the most important governing factor influencing prognosis in carcinoma of the rectum, as well as in other situations, is the intrinsic activity of the carcinomatous cell. Expressed in terms of grading of

malignancy, which recognizes as its basic fundamental the differentiation of cells, one is able to be extremely accurate in the prognostication of longevity of patients suffering from carcinoma.

Broders and I reviewed 598 cases of carcinoma of the rectum and rectosigmoid in which operation was performed in The Mayo Clinic between 1916 and 1926. It was readily apparent that the percentage of cases in which metastasis was present at the time of operation is in direct proportion to the grade of malignancy, and that the reverse was relatively true in the absence of metastasis. Taking the whole group, and counting it a good result if the patient lived over a definite period of years without recurrence or metastasis and died of some other cause, and as a bad result if the patient died from carcinoma, whether or not the recurrence was shortly after the resection, it was found that in the whole series, the influence of metastasis was indicated by the following: 20 per cent good results and 79 per cent total poor results when metastasis was present at operation and 57.8 per cent good results, and 42 per cent total poor results when metastasis was absent at operation. The conclusion is obvious from these figures that if a carcinoma of moderate grade may be radically extirpated, more than half of the patients with such growths have a chance of survival over a relatively long period. The added factor that growth in this situation is slow and metastasizes late increases the hopeful prognosis enormously, and one is encouraged to be optimistic as to future treatment.

During the last year in The Mayo Clinic, the radical operation of combined abdominoperineal resection, in one or two stages, was done in fifty-one cases, as against sixty-four posterior resections and nine anterior resections, showing a shift toward the more radical type of maneuver. By holding the mortality at or below 10 per cent, and with an operability of 55 per cent, it is anticipated that a higher percentage of satisfactory end-results will be secured in such cases. It is highly desirable that both the medical profession and the laity become more "colon conscious" in order that the initial symptoms of carcinoma of the rectum and colon may be more readily recognized and treated. It is obvious that the end-results following operation will be in direct proportion to the promptness with which advice is sought and the proper measures are instituted.

THE SEX HORMONES*

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THE always interesting field of endocrinology has been made even more interesting in recent years by the research efforts of some very able anatomists, physiologists and biochemists of our own and other countries.

We shall first discuss the hormones which affect the female genitalia, under the head of the body fluid or body tissue, from which they are derived. Then an effort will be made to indicate, as far as our present knowledge goes, the practical use to which they may be put.

The Ovaries.—Until comparatively recently only one hormone was supposed to be secreted by the ovary. Now we have evidence that at least six hormones are derived from this source. The most important two are known by various names. One, of follicular origin, has been called female sex hormone, folliculin, oestrin and theelin; the other, derived from the corpus luteum, is known as progestin or corporin.

Of the names given to the follicular hormone, theelin is probably now in most general use in this country. This hormone may be extracted not only from mature ovarian follicles, but from ovarian stroma, young corpora lutea, the human placenta, as well as the placentæ of the horse, sheep and cow. It has also been found in the umbilical cord, the amniotic fluid and the blood and urine of pregnant women. Progestin or corporin, while probably secreted only by the corpus luteum, may also be found in human blood and urine during pregnancy, as well as in the placenta.

The function of theelin is to cause growth and

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development of the fallopian tubes, the uterus and the vagina. In animals it also brings about a change in these organs, known as oestrous, which is evidenced by canalization of the vagina and cornification of its epithelial surface. In the monkey theelin alone cannot cause menstruation. It can develop the endometrium only to the interval stage.

The action of progestin is threefold:

(a) It supplements the action of theelin on the endometrium, causing development to the premenstrual or pregravid condition.

(b) It sensitizes the uterus for the reception of the fertilized ovum.

(c) It maintains pregnancy to the end of the first and probably to the end of the third month.

As clinicians we are particularly concerned with the effect of theelin and progestin when administered to the human subject. Will theelin, for example, develop the pubescent genitalia of the human female, or correct the menstrual irregularities resulting therefrom? It most probably will not, in the amount in which it can be administered. The unit of theelin is known as the rat unit, or the mouse unit. This is the amount of theelin which, when injected subcutaneously in the immature or the spayed rat or mouse, will cause cornification of the vaginal epithelium. Marrian and Parkes (1) have shown that 200 M. U. are necessary to produce typical estrous changes in the uterus of the mouse. The human patient weighs 2,000 times as much as the mouse. Therefore, in order to produce an effect on the human uterus similar to that produced by theelin on the uterus of the mouse, 400,000 M. U. are necessary. Now 1 mg. of theelin contains about 1,000 M.U. Therefore, 400 mg. would be necessary to bring the endometrium of the human uterus to the interval condition. The chief source of theelin is the urine of pregnant women. One gallon of urine yields from 0.5 mg. to 1.0 mg. of theelin. Therefore, at least 400 gallons of urine would be necessary to cause minimal histological changes in the uterus of one woman. Of course the ovaries are usually functioning to some degree and theelin is necessary only to supplement their activity. But even in such cases a much greater quantity of theelin is necessary than is generally supposed.

There are some who contend that the physiological action of a homone is not necessarily in proportion to the amount administered, and in support of this theory they claim to have obtained good results in the human subject by the use of theelin as a nasal spray, nasal jelly or vaginal suppository. I have not been able to find, in the literature, any experimental work which supports or refutes this theory as it applies to theelin; but it has been definitely shown by Brambell and Parkes[2] that if the concentration of the ovulation-producing hormone in the circulation of the rabbit after copulation is reduced by 40 per cent or more, ovulation is inhibited, and there is no scientific reason for believing that the action of theelin may not also be roughly proportional to the quantity administered. Even if a sufficient quantity of theelin were available for administration, it would not cause menstruation. To develop the endometrium to the premenstrual or pregravid condition, progestin or corporin is necessary, and this hormone has not yet been prepared in a form suitable for injection into humans.

The Anterior Hypophysis.—Most of our knowledge concerning the activity of the sex principles of the anterior hypophysis has been only recently acquired. Some workers, prominent among whom is Van Dyke,[3] believe that only one principle is secreted; while others, such as Zondek and Aschheim,[4] Hisaw,[5] Claus,[6] and Wiesner,[7] have produced considerable evidence in favor of two hormones.

The activating principle or principles extracted from the anterior hypophysis have been variously named by the different workers. Zondek and Ascheim have named them Prolan A and Prolan B, Wiesner Rho 1 and Rho 2; while Van Dyke, assuming the existence of only one principle, has given it the name hebin.

Prolan A and Rho 1 are the names given to the hormone which causes maturation of the primordial follicle, while Prolan B and Rho 2 are different names for the leutinizing hormone. These two hormones are supposed to be supplementary to each other; that is, Prolan A will first mature the primordial to a Graffian follicle and then Prolan B will cause leutinization of this follicle. Experimentally, ovulation seldom occurs during this process unless anterior hypophyseal implants are used. The Gonad-stimulating principle is found in the blood, urine, decidua and placenta of human pregnant females, but it is not found in the urine, decidua or placenta of pregnant animals, with the single exception of

the mare in the middle third of pregnancy. Unlike theelin, it is not found regularly in amniotic fluid. It is not found in cerebrospinal fluid during pregnancy, nor in the blood and urine of normal persons, except occasionally in infants.

Prolan A is very unstable. It is destroyed by boiling for a minute or being allowed to stand for a relatively short time. Both A and B are destroyed by the digestive enzymes and are, therefore, ineffective when given by mouth.

Prolan B is now available in a very concentrated form and has been administered, intramuscularly, in certain conditions with good results.

Placenta.—From the placenta, Collip[8] has separated two gonad-stimulating principles—emmēnin and A-P-L (anterior pituitary-like substance). It is doubtful if any female sex hormone at present available, with the single exception of emmēnin, is effective in humans by the oral route. The unit of emmēnin is the minimum amount which when administered in small doses to immature rats, over a period of three days, results in the appearance of estrous in from three to five days. Emmēnin is of value, chiefly in dysmenorrhea, and possibly in hemicrania.

A-P-L is administered subcutaneously. The day unit is defined as for emmēnin. Its effect on the ovaries is that of follicular maturation with normal ovulation and corpus luteum formation. It is of value in quite a few gynecological conditions, as I shall later indicate. A-P-L can also be obtained from the urine of pregnant women.

The placenta has been found to contain both theelin and progestin, but it probably acts only as a storehouse for these two hormones.

Our knowledge concerning the hormones described has already found many practical applications, very important among which are the various biological tests for pregnancy. Some of these I shall describe:

(a) *Ascheim-Zondek Test:*

The presence of ovary-stimulating hormone in the urine of pregnant women led Ascheim and Zondek to suggest the injection of a few c.c. of urine from a pregnant woman into immature mice as a test for pregnancy. The details of the test are as follows:

1. Five mice are injected with 0.3 c.c. urine, subcutaneously, twice a day for three days.
2. Weight of mice 6-8 grams; age 3-5 weeks.
3. The mice are autopsied at 100 hours after the first injection.

The effect on the mice is as follows:

1. Ripening of the follicles.
2. Hemorrhage into the mature, partly leutinized follicles.
3. Leutinization of the follicles with the formation of corpora lutea atretica.
4. Enlargement of the ovary.

The first and fourth reactions are suggestive of pregnancy; the second and third are diagnostic and usually can be determined macroscopically by naked eye inspection, or by the hand lens. Should there be any doubt regarding the reaction, the ovaries must be fixed and sections cut for microscopic study.

The urine used for the test should be a morning specimen to which is added a preservative (0.2 per cent metacresol is effective) if it is not to be used for some time. It should then be kept on ice until it is ready to be used or forwarded. Before being injected it is made slightly acid to litmus and filtered, if cloudy.

A positive test indicates the presence of living tissue derived from a fertilized ovum. It is positive in intrauterine and extrauterine pregnancy, hydatid mole and chorionepithelioma as long as the ovum or any of its elements are alive and proliferating. The reaction is positive from about a week after the period is missed until the end of the first week postpartum. The test is not entirely specific. While, if the patient is pregnant, the test will be positive in 98 per cent of cases, it is occasionally positive when the patient is not pregnant. The conditions likely to give a positive reaction in the non-pregnant woman are severe endocrine disorders, carcinoma, menopause, and probably bilateral ovariectomy.

The source of the Gonad-stimulating principle found in pregnant urine is not definitely known, but the weight of evidence does not favor the anterior pituitary.

(b) *The Friedman Test:*

Friedman[10] found that the adult rabbit could be used because of the fact that it ovulates only after copulation. Four c.c. of suspected urine is injected intravenously, three times a day for two days. Forty-eight hours after the first injection, the rabbit is anesthetized and the abdomen is

opened. If corpora lutea or corpora hemorrhagica are found, the reaction is positive.

(c) *The Reinhart-Scott Modification of the Friedman Test*[11]*:*

Five to fifteen c.c. of urine is given intravenously as a single injection. At the end of twenty-four hours the ovaries are examined and are usually found to be positive at that time if the patient is pregnant. If they are negative, 5 c.c. more of urine is injected and the ovaries re-examined through the same incision, twenty-four hours later.

(d) *The Brown Test:*

Recently, T. K. Brown,[12] and S. D. Soule,[13] of St. Louis, have injected the rabbit, intravenously, with the blood serum instead of the urine of pregnant women. The effect of the serum on the ovary was found to be the same as that of the urine.

Approximately 10 c.c. of whole blood are obtained from the patient and the serum removed. The serum is allowed to stand for at least four hours before injection, as fresh serum is toxic and may cause death. The average amount of serum was found to be 1 c.c. per 600 or 700 grams of body weight of the animal. Rabbits weighing from 1,500 to 1,600 grams gave the most constant result. Two false reactions are reported in a total of 350 tests.

In addition to the various tests for pregnancy, there are certain diseases where our knowledge of the sex hormones is proving to be of some value.

Distrophia Adiposo-Genitalis of Fröhlich.—The patient with this disease has obesity, pubescent genitalia and low metabolism. The cause of the metabolic changes is probably not in the pituitary gland itself, but in the hypothalmic region contiguous to the gland. Many physicians are treating this condition with theelin, anterior pituitary extract and thyroid extract. Potent pituitary extracts are now available. Of anterior-pituitary-like substances at present obtainable, Collip's A-P-L has greatest promise of value. Theelin, in amounts administered, has probably no effect. Thyroid extract supplies the deficiency in thyroid secretion, due possibly to the absence of the thyroid activating hormone from the pituitary or the infundibulum.

Functional Uterine Bleeding.—In this condition the histological findings are an absence of corpora lutea from the ovaries with persistence of unruptured Graffian follicles. The endometrium shows hyperplasia with occasional and irregular bleeding. The primary cause of this disturbance is dysfunction of the pituitary. In the ovary there is a persistent excess of theelin with little, if any, progestin. The treatment would therefore seem to be either progestin itself or anterior-pituitary-like hormones which would stimulate the ovary to the production of corpora lutea. Progestin is as yet unsuitable for administration to humans. Prolan B, such as Parke Davis Antuitrin S, has been given with success. Collip (14) has reported good results from his A-P-L in forty of these cases. In the simple type of menorrhagia, treatment for one week before the period is expected, materially reduces the flow. Menorrhagia, of the severer type, may require treatment for three months, or longer, before normal periods are established. Metrorrhagia is not so easily controlled as menorrhagia. The duration of treatment may be considerably shortened in cases where gentle curettement has been recently performed. When the uterine bleeding is secondary to pelvic infections, tumors, or large ovarian cysts, endocrin therapy is probably valueless.

Dysmenorrhea.—When this is primary, Collip reports excellent results from the oral administration of 5 c.c. doses of emmēnin t.i.d. before meals for seven to seventeen days before the onset of the period. Ninety per cent of Collip's cases were cured, or markedly relieved. If dysmenorrhea is secondary to pelvic infection, fibroids or large ovarian cysts, hormone therapy is probably of no therapeutic value.

Oligomenorrhea.—If the patient started to menstruate at a normal age and menstruated normally for some time but, later, menstruation became scanty and irregular, oral administration of emmēnin in 5 c.c. doses t.i.d. has yielded very good results. The longer the interval between menstrual periods, the fewer the number of cases that respond to this treatment.

At the University Hospital we have just succeeded, with A-P-L, in establishing normal painless menses in an unmarried nullipara of 21, who for about five years after onset of catamenia had normal periods but later developed dysmenorrhea and oligomenorrhea with frequent lapses. Other similar cases are now undergoing treatment.

If the patient has failed to menstruate for some years after the normal time for onset of

catamenia, little can be expected from endocrine therapy except possibly relief from headaches, and this is especially true if bimanual examination reveals a rudimentary uterus.

Menopause.—To relieve the symptoms of the menopause, A-P-L and probably emmēnin should, theoretically, be of value.

Sterility.—If this is due to pubescent genitalia, with occasional and scanty menstruation, A-P-L may establish normal periods and thus increase the chances of pregnancy.

Frigidity.— In most cases this condition is either psychic or due to rudimentary genitalia. In the latter case, nothing can be expected from hormone therapy, while in the former case, it can act only as a psychotherapeutic agent.

BIBLIOGRAPHY

1. Marrian, G. F., and Parkes, A. S.: The relative amounts of estrin required to produce various phenomena of oestrus. Jour. Physiol., 69:372, 1930.
2. Brambell, F. W. R., and Parkes, A. S.: Studies on ovulation IV. Relative importance of concentration and absolute amount of the ovulation-producing hormone. Jour. Physiol., 74:173. 1932.
3. Wallen-Lawrence, Zonja, and Van Dyke, H. B.: The gonad-stimulating substances of the anterior lobe of the pituitary body and of pregnancy urine. Jour. Pharmacol. and Exper. Therap., 43:93, 1931.
4. Zondek, B.: Die Hormone des Ovariums und des Hypophysenlappens. Julius Springer, Berlin. 1931.
5. Fevold, H. L., Hisaw, F. L., and Leonard, S. L.: The gonad-stimulating and the leutinizing hormones of the anterior lobe of the hypophysis. Am. Jour. Physiol., 97:291, 1931.
6. Claus, Pearl E.: Separation of anterior lobe substances and study of their individual effects. Physiol. Zoöl., 4:36, 1931.
7. Wiesner, B. P.: On the separation of the kyogenic hormone from human placenta. Edin. Med. Jour., 37:73 (Feb.), 1930.
8. (a) Collip, J. P.: Placental hormones. Canad. Med. Assn. Jour., 23:631, 1930.
   (b) Campbell, A. D., and Collip, J. P.: Notes on the use of certain placental extracts. Canad. Med. Assn. Jour., 23:633, 1930.
9. (a) Zondek, Bernhard: Darstellung des weiblichen sexual hormons aus dem Harn insbesondere dem Harn von Schwangeren. Klin. Wchnschr., 7:485, 1928.
   (b) Zondek, Bernhard: Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenlappen-hormons. I. Grundlagen und Technik der Method, Ibid. 7:1404, 1928.
   (c) Aschheim, S.: Die Schwangerschaftdiagnose aus dem Harn durch Nachweis des Hypophysenlappenhormons, II. Praktische and Theoretische Ergebnisse aus den Harnuntersuchungen, Ibid. 7:1453, 1928.
10. Friedman, M. H.: Mechanism of ovulation in the rabbit. II. Ovulation produced by the injection of urine from pregnant women. Am. Jour. Physiol., 90:617, 1929.
11. Reinhart, Henry L., and Scott, Ernest: A modification of the Aschheim-Zondek test for pregnancy. Jour. Am. Med. Assn., 96:1565, 1931.
12. Brown, T. K.: A proposed modification of the Aschheim-Zondek "pregnancy test." Am. Jour. Obst. and Gynec., 23:379, 1932.
13. Soule, S. D.: A further study of the anterior pituitary sex hormones. Ibid., 23:5, 708, 1932.
14. Campbell, A. D., and Collip, J. P.: Notes on the clinical use of certain placental extracts. Canad. Med. Assn. Jour., 23:633, 1930.

SOME PRACTICAL ASPECTS OF ALLERGY*

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ALTHOUGH the phenomenon of allergy has been observed for many years, its general and practical application in medicine is recent. Specific sensitivity has been observed since the beginning of medicine, and usually was termed idiosyncrasy. The reactions described consisted of violent gastro-intestinal disturbances due to certain foods, bronchial asthma because of contact with air-borne substances, and various acute manifestations of the skin. Schloss, in 1912, was the real pioneer in this subject, and developed the scratch tests for foods; it is only in the last fifteen or twenty years that these methods have been in general use.

The exact nature and fundamentals of allergy are not known, just as the fundamentals of immunity are not known. Von Pirquet originally defined allergy to include immunity, but a distinction is now made between the two. The fact that the practical application of allergy is com-

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paratively recent, together with this lack of definite knowledge as to its real nature, has created various degrees of opinion and enthusiasm regarding it. This reflects itself in the literature and has been confusing to the physician who has not made a special study of the subject; in fact, there is much difference of opinion among the men who have made allergy a specialty. Because of these existing variations of opinion it requires a good deal of courage to discuss allergy. In reviewing the literature I have noted more than fifty distinct syndromes which have been attributed to allergy and there seems to be no limit to the symptoms and diseases that are ascribed to it. These vary from the most minor conditions such as constipation and slight irritation of the bowels to the more serious disturbances, such as bronchial asthma and epilepsy. Whether a patient should be subjected to an extensive and expensive investigation for allergy should depend on the severity of the complaint and the amount of disability. It is obviously impossible to investigate all cases in which these various symptoms are presented, many of which are extremely mild. In Table I, I have attempted to group the manifestations for the purpose of making a practical working basis.

TABLE I. ALLERGIC MANIFESTATIONS

Respiratory	Gastro-intestinal
Vasomotor rhinitis	Diarrhea
Hay fever	Vomiting
Asthma	Colic
Cutaneous	Mucous colitis
Angioneurotic edema	
Urticaria	
Eczema	
Dermatitis	

We might add to this list of allergic manifestations many other conditions such as migraine, epilepsy, arthrjtis, irritation of the bladder, and so forth, but because of existing differences of opinion I have included only the more commonly accepted conditions.

Skin tests are being extensively used in an effort to determine the specific stimuli causing allergic reaction. It is not possible for the internist who sees only an occasional patient with suspected allergy to keep on hand a large stock of protein extracts for skin tests. If the foods, pollen, animal danders, and so forth, are included the number of preparations would run into the hundreds. It is possible, however, to keep on hand a few of the more common pollens and animal danders. Thus, a patient who lives on a farm may be tested with the dander of the animals with which he comes in contact or, if a patient's complaint is seasonal, he may be tested to the pollen of plants in his particular vicinity. In asthma and hay fever it frequently is possible to alleviate the patient's malady by having him avoid contact with these offenders, or in some instances to obtain successful desensitization.

Opinions are divided as to the value of skin tests to foods. I believe that most physicians engaged in allergic work have the feeling that the results are rather unreliable. It is a common experience to obtain negative skin reactions to food of patients who are clinically sensitive to that food. Conversely, many patients will give positive skin reactions to foods, the ingestion of which produces no symptoms. It is also interesting to note that a patient may give a positive skin reaction on one occasion and a negative reaction on another. The presence of a positive or negative skin reaction to foods is, therefore, not evidence that these foods are or are not offenders. In estimating the value of skin tests in the diagnosis of allergy, the present consensus of opinion seems to be that fair reliance may be placed on the results obtained by air-borne or inhalant substances, whereas the value of these tests to bacteria and ingested proteins has not been established.

TABLE II. SUBSTANCES TO WHICH PATIENTS ARE EXPOSED

Inhalants	Direct contact
Pollens	Drugs
Animal emanations	Plants
Dusts	Chemicals
Vegetable powders	Clothing
Molds	Infection
Ingested substances	Sinuses, and so forth
Foods	
Drugs	

In the absence of facilities for skin tests, there are other practical methods which assist in the determination of specific sensitization. The data obtained by skin tests must be corroborated by contact or elimination of contact with the excitant in position. In conjunction with the anatomic classification in Table I, one must keep in mind the substances which are most likely to

produce allergic manifestations. Since patients are exposed to offending substances by inhalation, ingestion and direct contact, these substances have been grouped in Table II, according to the usual method of contact.

Bronchial asthma and hay fever are the most significant clinical manifestations of the inhalant group, vasomotor rhinitis usually causing less discomfort. It is in this group that the skin tests are most reliable, but without them much valuable information may be gained. The pollens present the least difficulty since the patient's symptoms occur only in certain seasons. These may be roughly divided into three periods, the spring season due to the pollination of trees, the early summer season due to the common grasses which pollinate from early June to the middle of July, and the autumn season during which the weeds pollinate from early in August to frost. There are a few miscellaneous and domestic plants which may cause trouble at any time during the growing season. The patient may be relieved by avoiding contact with the offending pollen by means of changing location, or perhaps by preseasonal desensitization.

It is necessary to study every detail of the patient's home life and occupation to determine possible allergic factors in nonseasonal asthma and vasomotor rhinitis. The patient's contact with dust or molds found in grain dust, buckwheat and wheat in the process of milling, orris root face powders and other vegetable powders, must all be considered as possible factors. The question of bedding and upholstered furniture is important because of the cotton, feathers, kapok or animal hair used in their manufacture.

Whether symptoms are due to an inhalant may be determined by placing the patient in a dust-free room. There are various commercial air filters which make it possible for a room to be closed entirely to offending substances in outside air. A fairly efficient dust-free room may be constructed in the home with an electric fan, and an improvised air filter made of cotton batting placed in the window.

Allergic manifestations due to foods present a difficult problem. When urticaria, angioneurotic edema, bronchial asthma, or gastro-intestinal manifestations are of the acute type with abrupt onset and intense symptoms soon after the ingestion of food, it usually is easy for both the patient and his physician to determine the offending substance. However, in the chronic skin manifestations and in many mild and vague gastro-intestinal symptoms which have been attributed to food allergy, it is infrequent that a specific sensitization to food can be demonstrated. The unreliability of skin tests to foods has been mentioned. Elimination diets are extensively used at present, but they should not be used indiscriminately. Often the removal of a certain food is coincident with, but not the cause of the patient's improvement. It is not unusual to see patients who have eliminated many articles of food from their diet with resulting loss of weight and malnutrition and who, in some instances, have a definite food neurosis. It seems more practical to place the patient on limited but adequate diet and to add, one by one, the suspected articles of food and note the results. It may be necessary to repeat this process several times with certain foods to eliminate the element of coincidence.

The question not only of foods but of preparation of foods is important, as patients sensitive to cottonseed may obtain reaction from cottonseed cooking oils or salad dressings. At The Mayo Clinic recently I saw a patient who had urticaria when she had eaten only certain brands of canned fish, and it was discovered that these brands were canned in cottonseed oil.

Drugs usually present little difficulty, as in this instance the patient's reaction is likely to be severe and sudden with the ingestion or application of the drug.

In allergic skin disorders direct contact is equally significant or perhaps more so than the question of ingested proteins, and this again entails a detailed study of the patient's routine. Patch tests are valuable in determining these contacts and consist in placing the suspected article in contact with the skin and leaving it there for a few hours. A control patch of some other material should be used.

I have attempted to outline some practical methods of approaching the diagnosis of the specific excitant in allergic disease. In spite of prolonged and detailed study, we are confronted with the fact that, with the exception of pollens and animal danders, the specific excitant is not discovered in the majority of cases. One has only to recall the many failures in chronic asthma and urticaria to appreciate the truth of this statement. The allergic patient has inherited or ac-

quired a predisposition to allergic reaction. In some instances, this allergic state is constant and the patient has a reaction whenever he is exposed to his offending allergens. This usually constitutes the case of sudden onset and intense symptoms. We have learned, however, that there are many nonspecific excitants which will precipitate an attack in subjects so predisposed. This probably is because a certain degree of tolerance exists to the exciting factors and the nonspecific excitants overcome this tolerance and produce the allergic state. In fact, it is not always necessary that the specific excitant be present, as is shown by the fact that emotional upsets may produce a reaction. Because of the difficulty and uncertainty of fixing the responsibility on a specific allergen, a study of the nonspecific factors is often the physician's only means of attack in the treatment of his patient. Maytum has likened the allergic patient to a loaded shotgun with several triggers, any one of which is capable of precipitating an allergic explosion. These triggers may be specific or nonspecific excitants, the latter including infection, local irritation to the skin, respiratory or gastro-intestinal tract, malnutrition, and general lowered resistance. Probably most significant among the nonspecific excitants is fatigue, nervous exhaustion or emotional upsets and general physical debility.

I shall choose asthma as an example of illustrating this feature. Given a patient suffering with prolonged asthma, in whom, after a detailed search for the specific cause, we are unable to find the offending allergen. The patient has lost weight, is in a state of exhaustion from loss of sleep and, in most instances, has become fearsome and apprehensive. His loss of weight in many instances is due to the fact that he has been so advised or on his own initiative he has followed an elimination diet to the extent that he has been deprived of sufficient nourishment to keep in good general condition. He may have nasal polyps and some sinus infection. However, many of the nasal conditions seen in bronchial asthma are secondary results and not primarily the cause. Although we believe in clearing up existing infections in the sinuses, a good rule to follow is to do nothing to the nose for the asthma that should not be done for the sake of the nose itself. Adherence to this rule would eliminate many unnecessary operations so often employed in the treatment of asthma. When we begin the examination of this patient, we impress on him the fact that we probably will not find the specific protein responsible, although such sensitivity may be present. We explain to him the mechanism of bronchial constriction and alleviate his fears by assuring him that he has not the fatal type of asthma such as is seen in cases complicated by lesions of the kidney and heart. He is informed that he is an allergic individual, and that at any time that he is subjected to a specific or nonspecific excitant, he may have bronchial constriction. Every effort is made to improve the patient's nutritional condition and to remove his apprehension. By instilling such assurance and confidence and improving the general condition we very often are able to change the patient from his allergic state to a state of tolerance sufficient to improve his asthma. When it is understood that we cannot promise a complete and permanent cure by any one procedure, but that the treatment is designed to correct a variety of causes in an effort to change a condition from continuous to occasional asthma, it is surprising how many invalids can be transformed into useful citizens.

I wish to emphasize the difficulty in demonstrating specific excitants in allergic disease and that, when they are demonstrated, their removal does not always prevent an allergic patient from having allergic reactions from other causes. Under these conditions, a careful study of the nonspecific excitants and education of the patient are often the means of bringing him relief. In other words, rational practice of medicine combined with allergic study will produce better results than investigation from the allergic standpoint alone.

THE SCIATIC SYNDROME*

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THIS is not an attempt to present something new, but rather an effort to gather together our present knowledge concerning the causes and the rational treatment of a very old yet extremely common and important condition.

About 1750, Cotunio described pain in the lower part of the back, with pain in the lower limbs, as a clinical entity, "sciatica." Since that time the term sciatica has been used to describe a great variety of clinical conditions presenting a certain symptom-complex, the common factor of which is pain in the lower back with pain along the course of the greater sciatic nerve, or the latter alone. Following the views of Grossman and Keschner,[1] I would suggest that this symptom-complex be referred to as the sciatic syndrome, since it is not a true clinical entity.

Just what symptoms and findings may compose this syndrome? The sensory part of the complex is characterized by the basic symptom, pain in the lumbar region, with pain along the course of the greater sciatic nerve, or pain in the sciatic distribution alone. This pain is almost always unilateral—may be acute, subacute or even chronic, mild or severe, and may or may not be intensified by pressure along the course of the nerve or by straight leg raising (Lasègue's sign). The other subjective sensory disturbances are of the nature of paresthesias over the lateral aspect of the leg and dorsum of the foot. Objective evidences of disturbance of superficial sensibility are not commonly found but when present they are usually in the form of diminished sensibility (occasionally hyperesthesia) over the same areas to which the subjective complaints are referred.

The motor portion of the syndrome involves muscular tonicity, atrophy, disturbance of reflexes, and the position assumed by the patient in motion and at rest. Some degree of loss of muscle tone is a common finding, but atrophy is seldom marked or even moderate unless the underlying difficulty is a true neuritis or an effect secondary to gross pressure upon the component parts of the nerve, such as may occur with a pelvic neoplasm. The Achilles reflex is absent in from one-third to one-half of all cases. This reflex may disappear early and may never return even though complete recovery takes place otherwise. The knee-jerk may be exaggerated due to hypotonia of the muscle of the posterior aspect of the thigh. In those few cases in which the second or third lumbar spinal nerves are involved as well as the spinal nerves forming the sciatic nerve, there may be absence of the knee-jerk. When the patient is at rest in the standing position, a scoliosis of the lumbar spine, with many times an associated flattening of this portion of the vertebral column, is frequently seen. This list may be toward or away from the affected side or may even alternate. The contralateral type is by far the most common. Muscle spasm along the lumbar spine is a frequent finding. In less severe and more recent cases this abnormal curve disappears on lying down. The affected limb may be drawn up on reclining, if the pain is severe. In walking, there is a limping gait which favors the affected side.

In addition to these sensory and motor symptoms and findings, there may be sympathetic disturbances such as dry scaly skin and coldness of the affected extremity. Occasionally edema and gross trophic disorders may be seen.

It is self-evident that all of these symptoms and findings can never be present in any one case. I wish to again emphasize the point that pain along the course of the greater sciatic nerve, with or without associated lumbar pain, is the one constant factor in the syndrome.

I will now offer a classification of the chief varieties of the sciatic syndrome, making the distinctions upon the basis of etiology in so far as practicable, briefly characterizing each type and leaving the consideration of their treatment until later. In this discussion we shall consider: (1) the sciatic syndrome secondary to general disease or gross pressure; (2) true sciatic neuritis; (3) the sciatic syndrome due to myositis or fibro-myositis; (4) the sciatic syndrome due to neurodocitis.

Before anyone can classify a case presenting

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this symptom-complex a very careful history must be taken, followed in turn by a thorough physical examination, which includes, in addition to a general physical examination, rectal, pelvic and neurological examinations. Many times X-ray films of the teeth, sinuses, gallbladder and alimentary canal must be taken. Almost every case requires roentgenograms of the pelvis and lower spine. Laboratory investigation of the blood and urine should be instituted. Finally each lead found must be thoroughly followed through.

It is well known that this syndrome may be secondary to general disease or gross pressure, but this fact is often entirely overlooked or considered very lightly. Such an attitude is, of course, not warranted and result in glaring errors. This symptom-complex may occasionally be a part of such general diseases as syphilis, diabetes, lead-poisoning and alcoholism. Tumors and true inflammations such as tuberculosis of the vertebræ or of the pelvic bones, tumors of the pelvic organs or rectum and tumors of the cauda equina[2] may produce such symptoms. Osteo-arthritis of the hip joint is a cause often overlooked.[3,4] Certain symptoms and findings, when present, aid in placing a case in this group. They are: bilateral pain or pain in the perineum, groin, abdominal wall or anterior aspect of the thigh, in addition to the sciatic pain; deformities of the spine other than the scoliosis described above; marked muscular wasting or paralysis; any disturbance of sphincter control or sexual power, and any severe sympathetic symptoms such as edema or gross trophic changes.

True sciatic neuritis, although very rare, does occur. The common causes are exposure to cold and wind, infection following direct injury, and foci of infection. The condition is really a perineuritis. As Riley has said, a true neuritis should show loss of muscle power, atrophy, decrease or loss of reflexes and alterations or reductions in sensory perceptions. Pain, or at least tenderness of the nerve trunks on palpation, especially at the sacro-sciatic notch and where the nerve enters the thigh, is almost always noted. Pain in the area of the affected nerve may also be present.

There still remains a large group of cases which were formerly considered "idiopathic" or "essential sciatica," the causes of which were not made manifest until recently. A survey of the literature shows a wide variation in opinion as to the relative frequency of these two etiologic factors, but it is safe to say that between them they account for at least 80 to 85 per cent of all cases presenting the sciatic syndrome. These factors are myositis or fibro-myositis and neurodocitis.

Certain investigators, notable among them Riley,[5] Titus[6] and Casamajor,[7] have reached the conclusion that in the vast majority of instances pain in the lower back, radiating down the course of the sciatic nerve, is due primarily to a myositis or fibro-myositis, which may be acute, subacute or chronic. Of course, this inflammation, if it is an inflammation (and a small amount of laboratory work has shown indication that this is true), is secondary to something else. The underlying causes are said to be trauma, irritation, and, in the chronic cases in particular, foci of infection. Those foci most frequently noted are the sinuses, tonsils, teeth, prostate and gastro-intestinal tract. In addition to our ever-present basic symptom of pain we have the following picture which I have quoted directly from Riley: "On examination certain simple physical symptoms can be elicited. In the first place, no evidence of involvement of the central or peripheral nervous systems can be elicited. Definite, localized, more or less acute tenderness to direct or deep palpation over the muscle mass itself is always present, and in favorable instances it is possible to find areas of apparent infiltration in the muscle tissue which may be so numerous as to give the impression of rubbing the thumb over a corrugated washing-board. The effect on the muscle itself of the presence of this inflammatory focus is to produce a localized or generalized spasm in the lumbar region, which may actually produce a tortipelvis and an apparent shortening of one limb." This myositic or fibro-myositic condition may be found in striated muscles anywhere, but its favorite location is in the lumbar and gluteal muscles. It is the same type of process which produces "brachial neuritis."

There remains to be considered, then, neurodocitis. This term, introduced by Sicard, is taken to indicate pain due to stimulation of a nerve by the bony foramen or canal which contains it. Putti[8] has said that the sciatic syndrome, except when due to a true neuritis, or when secondary to gross pressure or definite general disease, is symptomatic of vertebral arthritis, *i.e.*,

"It is caused by pathological conditions of the intervertebral foramina and especially of the intervertebral articulations." In other words, it is a symptom of neurodocitis. This is not a conclusion born of a short period of speculation but represents the results of many years of study by Putti and other noted investigators. The first work of importance of this nature was introduced by Goldthwait,[9] who called attention to certain anomalies of the vertebral column, such as sacralization of the fifth lumbar vertebra and variations in the posterior articulations, and suggested their connection with sciatic pain. This indeed is one of the causes of neurodocitis, but not the most frequent cause.

In order to understand Putti's statement, quoted above, we shall have to review briefly the anatomy of the sciatic nerve, in part, and that of the vertebral foramina, as brought out by Goldthwait, and more particularly by Danforth and Wilson.[10]

The greater sciatic nerve takes origin from a part of the anterior branch of the fourth lumbar nerve, plus the anterior branches of the fifth lumbar and the first, second and third sacral nerves. Since the gluteal nerves have essentially the same origin it is seen that the fifth lumbar nerve supplies fibres to all the muscles of the buttocks, of the posterior aspect of the thigh, of the leg and of the foot. There are a few minor exceptions to this statement. The cutaneous distribution of the fifth lumbar nerve is generally acknowledged as including the lateral aspect of the leg. Then, too, one should recall that within the bundles of efferent motor fibres derived from the fifth lumbar nerve and supplying the muscles referred to there are afferent pain fibres returning from those muscles. Considering the above listed anatomical facts, it can be seen how encroachment upon the fifth lumbar nerve could give rise to the variety of the sciatic syndrome now under discussion.

Investigators have further shown that the intervertebral foramen, through which the fifth lumbar spinal nerve passes, is smaller than any of the corresponding foramina above—the fourth lumbar foramen being definitely larger and each succeeding foramen becoming still larger. Moreover, the nerves that pass through these openings vary inversely with the size of the foramina—*i.e.*, the fifth lumbar nerve is the largest and the fourth somewhat smaller. It is to be noted that the boundaries of the intervertebral foramina are as follows: superiorly there is the inferior intervertebral notch; anteriorly is a little of the posterior part of the vertebral body above, a little of the intervertebral disc and a little of the posterior part of the body below; inferiorly there is the superior intervertebral notch; while posteriorly is found the posterior articulation, a factor of much importance in regard to the production of the sciatic syndrome. Some authorities, among them Cox,[11] feel that sacro-iliac subluxation may cause sciatic symptoms by mechanical irritation of the lumbo-sacral cord, because in entering the pelvis it passes over the upper part of the sacro-iliac joint, where it is closely bound to the anterior ligaments of the joint—the nature of the passage of this cord amounting to a continuation of its bony canal, making it the longest of the canals which are traversed by the component parts of the sciatic nerve.[12]

Considering these anatomical facts, it may readily be understood how anomalies, particularly those of the posterior articulations and that of "lumbar-sacralization" and arthritis involving the intervertebral foramina (frequently seen in the posterior articulations) may cause neurodocitis.

The value of accurate X-rays cannot be overemphasized. Putti[8] says: "Perfect radiograms and experienced examiners are indispensable." Lateral views are necessary as well as anteroposterior plates. It is impossible to obtain a proper impression of the articular facets without stereoscopic films and the lateral views are required to properly judge the proportions and conditions of the intervertebral canals. X-ray may show anomalies of articular tropism, signs of arthritis about the articular facets or their anklosis partial or complete. The sacro-iliac and lumbo-sacral joints may show subluxation. Arthritis of the bodies of the vertebræ is of little importance as a causative factor of this symptom complex. Here, again, we are faced with the problem of finding the cause behind the arthritis involving the intervertebral foramina. Trauma must play a large rôle and most certainly foci of infection are of very great importance. Osgood[13] emphasizes the importance of absorption of toxic substances elaborated in the large bowel associated with intestinal stasis as a causative factor of arthritis in the lumbo-sacral spine.

The clinical phenomena exhibited in addition

to the basic pain are pain on straight leg raising, absence of the ankle-jerk in many instances, slight muscle atrophy and sometimes sensory disturbances. Rigidity of the lumbar spine, with lumbar muscle spasm and a scoliosis in the lumbar portion of the vertebral column are characteristically present. Only the matter of scoliosis needs further comment here. The contralateral type is by far the most common and it results in the spreading of the articular surface of the intervertebral joints on the painful side and also widens the intervertebral canals. The homolateral scoliosis relaxes the joints and the spinal nerves on the affected side. In those cases in which the alternating list occurs, the arthritis is said to be bilateral and the reversal of the abnormal curve is felt to be necessary for rest of these painful articulations.

This factor of scoliosis is a strong support to the theory that the most important factor in the etiology of neurodocitis in this region, and hence the sciatic syndrome of this variety, is localized arthritis of the joints between the fourth and fifth lumbar vertebræ. The finding by Labat and Greene[14] of involvement of the second and third lumbar nerves in some cases further supports the neurodocitic theory.

When the matter of treatment is considered, it becomes evident why emphasis has been placed upon the fact that the sciatic syndrome may be caused by a variety of conditions. Obviously, considering it as a clinical entity has led to utter confusion concerning its therapy. One cannot expect the same results from injection of the nerve proper when the difficulty lies in an arthritis of the lumbar intervertebral foramina with secondary nerve involvement, that one will receive from the same treatment when the causative factor is a true neuritis. Again, physiotherapy to the gluteal and lumbar muscles will not relieve a condition caused by a tumor of the cauda equina. Rational treatment demands a thorough investigation of the individual case, followed by its classification under one of the above headings if possible and logical treatment of the causative factor whenever at all practicable.

The thought probably arises, "That is unquestionably the scientifically proper attitude toward the problem, but it is not practical." It is true that many of these patients are suffering from severe acute pain and present the picture of abject misery, that investigation of these cases often requires a considerable period of time and that something must be done to afford relief from pain without delay. Therefore, we will first outline a plan for the immediate handling of sciatic pain, to be used in those cases where such relief is imperative, pending the detailed investigation which must follow.

Rest in bed, heat and analgesic drugs may be sufficient to allay the pain. If such procedures do not suffice, recourse to sacral epidural injection should be had. This consists of the injection of from 60 to 100 c.c. of sterile normal saline into the sacral epidural space. The technic is a simple one. The patient is placed upon the affected side, with the thighs and legs somewhat flexed. The hiatus sacralis is then located about five centimeters above the tip of the coccyx. At this point, slightly to either side of the midline, the cornua of the sacrum can be felt. Under strict asepsis and with preliminary skin infiltration, if desired, either a Labat spinal needle or an ordinary spinal puncture needle is inserted at this point, at an angle of about 45 degrees, and a small amount of novocain injected. This is continued until the needle can be felt to impinge upon the bone (the sacrum) when it is depressed about 15 degrees and then further advanced two or three centimeters. It usually enters the canal without difficulty and care must be taken not to puncture the dura. When the needle is felt to be in the canal, suction is made with a syringe, to see if the subarachnoid space has been entered. If this has occurred, spinal fluid will enter the syringe, in which case the needle must be withdrawn a short distance and several minutes allowed to elapse before applying suction again. Once being assured that the needle is truly in the epidural space, the sterile solution at body temperature is slowly injected by means of a 20 c.c. syringe. The patient should remain quietly on the affected side for about forty-five minutes, following the injection, and should remain in bed for twenty-four hours or longer. Usually a feeling of distress or pain in the sacral region occurs, particularly toward the end of the injection. Many times a severe pain of short duration is noted in the affected limb. Where quantities larger than 100 c.c. have been used, paresthesias are reported. Very temporary loss of sphincter control sometimes occurs. Evans[15] has reported a case where a severe reaction in the form of

"cyanosis, opisthotonos, unconsciousness and incontinence of urine and feces" followed the injection of 120 c.c. of 2 per cent novocain. The patient regained consciousness within half an hour and made a complete recovery. Almost invariably the symptoms concomitant with the injection are not at all serious and their duration is usually only fifteen to twenty minutes.

The mechanism by which this injection acts is said to be a mechanical stretching of the component nerve roots of the sciatic nerve. Evans[15] presents some good experimental work to prove this contention. Daspit[16] and Ott[17] also claim a very high percentage of cases which receive immediate relief from this form of therapy. The injection may be repeated every forty-eight hours, for three or four times, without ill effect, if this is necessary or desired. This is a simple procedure which is readily available to any general practitioner anywhere.

Another very satisfactory method of securing immediate relief of pain has recently been described by Labat and Greene. The treatment consists of individual blocking paravertebrally of the nerves involved, by injection of weak solutions of alcohol and neocaine. The affected nerves were singled out by means of the "electric percussion hammer"—a small electric vibrator which transmits its vibrations deeply, causing pain whenever the vibrations make or break contact with a diseased nerve or branch of a diseased nerve. Tracings were made along the painful areas and by their anatomical distribution the involved nerves could be determined. The solution injected did not exceed "5 c.c. of 95 per cent alcohol in any individual in no greater concentration than 33 per cent in 1 per cent neocaine solution." During the injection, when the solution reached the desired point, paresthesia of a burning type occurred over the distribution of the injected nerve, which feeling was replaced early by a sensation of warmth and swelling. Remote sensory manifestations after blocking were rather marked in some cases, burning feeling followed by pins and needles sensations being the most common, and were sometimes quite prolonged. Success of the injection could be checked by the "electric percussion hammer." Splendid results are claimed for this treatment, which has just recently been introduced, but it requires a much greater degree of technical skill and demands absolute accuracy in eliciting the nerves involved.

Although permanent relief has been reported in many cases following these procedures, mere relief of pain should not distract the physician from seeking the underlying cause of the disability, nor from proceeding with more rational treatment whenever possible.

If thorough investigation shows the sciatic syndrome to be secondary to a general disease such as syphilis, diabetes or lead poisoning, obviously treatment must be aimed at the primary causative factor in each individual case. Sacral epidural injection may be of great value in obtaining comfort for the patient while specific therapy is under way. In those instances due to tumor of the pelvic organs, of the cauda equina, et cetera, *i.e.*, lesions which exert gross pressure on the sciatic nerve or its constituent parts, the underlying cause should be dealt with surgically where feasible. In those cases of malignancy no longer amenable to eradicative procedures, caudal injection is again the method of choice. Repeated injections at intervals, as required, may be carried out and the use of a sterile non-absorbable or relatively non-absorbable medium, such as liquid petrolatum or iodized oil, has been tried in these cases a number of times with favorable results. By these procedures, the individual may be kept quite comfortable even over periods of many months.

The principles governing the treatment of neuritis elsewhere dictate the care of sciatic neuritis, namely, rest, heat and the relief of pain. In the case of sciatic neuritis, this means rest in bed, preferably with the affected limb wrapped in sheet wool. Diathermy from the lumbo-sacral region to the toes gives a moderate heat throughout the course of the nerve, and along with galvanism is of value in moderately severe and acute cases. In chronic cases, injection of 50 to 100 c.c. of sterile normal saline following immediately a preliminary injection of 2 c.c. of two per cent novocain within the nerve sheath gives a good result in most cases. Injection may be made either at the level of the ischial tuberosity or in the middle of the buttock, where the nerve has just left the sacro-sciatic notch. At the latter point, the nerve is more difficult to locate, but if most of the pain is gluteal the injection should be done at that point.

The technic is as follows[18]: The patient is placed, face downward, on the table, and the site for injection chosen. A small area of the over-

lying skin is then anesthetized and a rather large needle about four inches in length is inserted vertically through the anesthetized area, until the nerve sheath is reached. On reaching the sheath, either it will be felt with the needle or the patient will complain of pain, or both. When one feels he is within the sheath, about 1 c.c. of saline is injected. If the saline is within the nerve sheath the patient will feel a "thrill" pass down to the calf or heel. When satisfied that the point of the needle is within the sheath, 2 c.c. of the novocain solution are injected and when the pain has stopped and the leg feels "dead" or numb, 50 to 100 c.c. of warm sterile saline are introduced. The patient should be kept in bed twenty-four to forty-eight hours. This procedure may be repeated in five or six days if desired. If not successful with the injection at the higher level, sacral epidural injection should be used.

Attention must be called to the necessity of removing foci of infection except during an acute attack. We must remember the gastro-intestinal tract as a possible focus in these cases.

In those instances where this symptom complex is felt to be due to myositis or fibromyositis, physical therapy is the choice. We must not lose sight of the fact that in the subacute and chronic cases of this type the most likely underlying basis is focal infection, and all foci of infection must be adequately treated. Titus[6] has reported the results of observations in over 600 cases which he feels belong in this group. If the case is an acute one, treatment is commenced with radiant light for the purpose of inducing an hyperemia. When this object has been attained, static breeze is employed, and, as improvement occurs, static wave and sparks are used finally. In subacute and chronic instances, diathermy through the pelvis in the region of the sacro-sciatic notch is employed, followed again by the use of the static electricity. Sinusoidal current may be substituted for static electricity if the latter is not available. Deep heat is thus secured, plus the decongesting and muscle stimulating effect of static electricity. Diathermy to the entire course of the nerve and galvanism, as well, are useless here. Massage also is of little value.

Gratifying results are claimed following a few treatments in acute cases, and very satisfactory improvement has occurred in the chronic type. While static electricity is rightfully given great credit in these cases, the importance of treatment of foci of infection, particularly in the cases of longer standing, must not be overlooked.

In those instances where one feels that the sciatic syndrome has been produced by a neurodocitis due either to arthritis of the intervertebral foramina or to the less common cause, sprain and subluxation of the sacro-iliac or lumbo-sacral joints, the guiding principle is immobilization.

In milder and more recent cases, rest in bed, physiotherapy and analgesics, with immobilization by adhesive plaster strapping may suffice. In the more severe and less recent cases, more extensive procedures may be required.

Putti[8] prefers a method which brings about complete immobilization gradually and uses heat as an adjunct. He gives a hot air bath at 90 to 125 degrees for one-half hour daily, to produce an hyperemia. As soon as the pain will allow the patient to stand without great discomfort, immobilization is secured by a plaster-jacket, which gives fixation to the pelvis and trunk, except the shoulders. He emphasizes the fact that this jacket must immobilize only and not attempt to correct the scoliosis present. The cast is left on the first day only long enough for the plaster to dry, is then bivalved and removed. It is worn for an increasing period of time each day, until in about ten days it can be worn by the patient continuously. After two to three months it may be replaced by a corset, which is worn up to a year.

Immobilization may be secured by following a different plan of procedure which is well described by Kleinberg,[19] who, however, feels that sprains of the sacro-iliac and lumbo-sacral joints are more common causes of the sciatic syndrome than is arthritis of the intervertebral foramina. Certainly the method is of equal value whether one attributes the symptoms to the joint strain or to a neurodocitis resulting, if it does, from such a strain. This form of therapy should be restricted to those chronic resistant cases with "fixed" scoliosis. It is designed to break up all adhesions between the lumbar muscles and between the lumbar vertebral articulations, and to immediately correct the deformity as well as to secure immobilization. Briefly, it consists of manipulation, under anesthesia, of the lumbar spine from side to side, followed by hyperextension of the lower limbs until the flatness of the lumbar portion of the vertebral column referred

to above is replaced by the normal concavity. A spica cast, which includes the painful limb, then is applied, thus securing immobilization of the spine and affected limb. In some cases, before applying the cast and following manipulation of the spine, Kleinberg uses forceful stretching of the sciatic nerve, by forcefully flexing the affected lower extremity (with the knee extended), until the leg can be brought to within fifteen inches of the face. This particular portion of the treatment is in general not held in high repute and for the most part has been discarded. It involves, of course, the danger of causing traumatic rupture of the sciatic nerve.

The cast is left on for three weeks, at the end of which time it is temporarily removed, and the patient measured for a Knight spinal brace. Physiotherapy, in the form of heat, gentle massage and graduated exercises of the extremity and back muscles is then begun, and in ten to fourteen days, with brace applied, the patient is able to begin walking. With continued physiotherapy, the individual is said to be able to return to his work about six weeks after he begins to walk.

Excellent results are claimed for this form of therapy. It is particularly suited for chronic cases, due to neurodocitis, for it affords immobilization of the inflamed and subluxed joints in their normal position, and the physiotherapy aids in the absorption of inflammatory products.

Whichever of these methods may be chosen to combat the joint conditions per se, foci of infection whenever present must be adequately treated.

SUMMARY AND CONCLUSIONS

1. The symptom-complex generally called sciatica is not a clinical entity and should be referred to as the sciatic syndrome.

2. Classified on an etiologic basis, four chief varieties of this syndrome are discussed:

(a) That variety secondary to general disease or gross pressure.

(b) True sciatic neuritis.

(c) That variety due to myositis or fibromyositis.

(d) That type due to neurodocitis.

3. Rational treatment demands thorough study of each case, accurate classification, if possible, and logical treatment of the causative factor whenever practicable.

4. Methods for immediate handling of sciatic pain pending investigation are outlined.

5. The most satisfactory therapy for each of these four varieties of the sciatic syndrome is presented.

REFERENCES

1. Grossman, M., and Keschner, M.: The sciatic syndrome. Arch. Neurol. and Psychiat., 21:398 (February), 1929.
2. Farley, D. L.: Two cases illustrating difficulties in diagnosis of spinal cord tumors with sciatic and lumbar pain. Med. Clin. No. Am., 14:967 (January), 1931.
3. Feiling, A.: Sciatica; its varieties and treatment. Bost. Med. Jour., 1:386 (Mar. 10), 1928.
4. Buckley, C. W.: Sciatic pain; its diagnosis and treatment. Practitioner, 124:653 (June), 1930.
5. Riley, H. A.: Neurologic aspects of low-back pain. Jour. Am. Med. Assn., 90:429 (Feb. 11), 1928.
6. Titus, N. E.: Treatment of sciatica by physical measures. Arch. Phys. Therapy, 12:662 (November), 1931.
7. Casamajor, Louis: Personal communication to N. E. Titus, quoted by the latter. Arch. Phys. Therapy, 12:664 (November), 1931.
8. Putti, V.: New conceptions in the pathogenesis of sciatic pain. Lancet, 2:53-60 (July 9), 1927.
9. Goldthwait, J. E.: The lumbo-sacral articulation: An explanation of many cases of "lumbago," "sciatica" and paraplegia. Boston Med. and Surg. Jour., 164:365 (Mar. 9), 1911.
10. Danforth, M. S., and Wilson, P. D.: The anatomy of the lumbo-sacral region in relation to sciatic pain. Jour. Bone and Joint Surg., 7:109 (January), 1925.
11. Cox, H. H.: Sacro-iliac subluxation as a cause of backache. Surg., Gynec. and Obstet., 45:637 (November), 1927.
12. MacKinnon, A. P.: Sciatica (an appreciation of the work of Danforth and Wilson). Canad. Med. Assn. Jour., 22:492 (April), 1930.
13. Osgood, R. B.: Etiologic factors in certain cases of so-called sciatic scoliosis. Jour. Bone and Joint Surg., 9:667 (October), 1927.
14. Labat, Gaston, and Greene, M. B.: Diagnosis and treatment of the so-called sciatic neuralgias. Am. Jour. Surg., 11:435 (March), 1931.
15. Evans, W.: Intrasacral epidural injection in the treatment of sciatica. Lancet, 2:1225 (Dec. 6), 1930.
16. Daspet, Henry: The immediate handling of sciatic pain. New Orleans Med. and Surg. Jour., 83:596 (March), 1931.
17. Ott, W. O.: Results of treatment in forty-eight cases of sciatica. Am. Surg., 76:272 (August), 1922.
18. Martin, J. P.: The treatment of sciatica. Lancet, 1:993 (May 22), 1926.
19. Kleinberg, S.: Symptoms, causes and treatment of sciatic scolioses. Internat. Jour. Med. and Surg., 42:631 (December), 1929.

UNSUSPECTED LUES REVEALED BY THE ROUTINE WASSERMANN TEST*

CHARLES R. DRAKE, M.D.
Minneapolis

IN October, 1931, a routine Wassermann was done on all cases admitted to the Swedish Hospital, Minneapolis, on medical, surgical and obstetrical cases. Tonsil cases were not included in this work. Practically all specimens were taken the day following admission. This work was done with the hearty coöperation of the hospital staff and of the patients themselves. The patients were almost unanimous in being glad to have a "blood test" but were not told the nature of the test.

The following report covers the work done for the months of November, December, 1931, and January and February, 1932, one-third of a year. It has been found that the results varied considerably for each month. During these four months 1,113 routine Wassermanns were performed, of which sixteen were positive. These positives were all strongly positive, all being four plus with the exception of three which were three plus. The positive cases were all rechecked and a second test performed confirming the results in all cases. The tests were performed with two antigens, plain alcoholic and cholesterinized. They were equally positive in both.

The positives varied each month from 3 per cent in December to 1 per cent in February, with an average of 1.5 per cent for the series.

All of these positives were cases of unsuspected syphilis, were evidently chronic infections which had never been treated and were coincident with the various medical or surgical conditions for which the patients were admitted to the hospital.

The admittance diagnosis in the positive cases were as follows:

Case

1. Carcinoma of Bladder (confirmed by autopsy).
2. Toxic Thyroid (operated); Pleural Effusion.
3. Fibroid Uterus (operated).
4. Carcinoma of Uterus (confirmed by biopsy).
5. Eczema (extensive).
6. Double Vagina (operated).
7. Fracture of Hip.
8. Fracture of Tibia.
9. Incomplete Abortion (curettage).
10. Accident (fracture).
11. Acute Appendicitis (child ten years, operated).
12. Sub-acute Appendicitis (operated).
13. Hernia (operated).
14. Ovarian Cyst; Appendix (operated).
15. Abdominal Ascites, Cardiac.
16. Nervousness (acute attack of indefinite symptoms).

In all of these cases the presence of syphilis was entirely unsuspected. Upon further questioning, a few of the patients gave suspicious histories, but many did not.

This is but a preliminary report and a larger series of cases is desired in order to ascertain the true percentage of infections, but it is interesting to note the relatively high percentage of positives in this rather select series of cases in a private hospital.

It is of further interest to note that so far there have been no positive reactions among the maternity patients, which quite clearly proves the fallacy of pregnancy being a cause for false positives.

It would also be of much interest if the study were carried out on all tonsil cases, especially in adults, for I have seen several instances where tonsils were removed only to find later that treatment for syphilis was the proper indication.

Again practically all of the above patients were apparently normal except for the various diagnoses for which they were brought into the hospital, illustrating the fact that syphilis, especially chronic syphilis, often presents no general symptoms, or its symptoms are masked by other conditions.

In carefully performed and checked Wassermann tests there is no need for questioning the correctness of a positive reaction, especially with a plain alcoholic antigen, and there is no danger of any coincidental disease producing a false positive. All questionable reactions such as a possible one plus were rejected and called negative. It is in the latter cases that highly sensitized antigens may produce false positives and false diagnosis.

*Read before the Hennepin County Medical Society, Minneapolis, April 6, 1932.

THE COMBINATION OF AMYTAL WITH EPHEDRINE IN THE TREATMENT OF ASTHMA*

MELVIN W. BINGER, M.D.
Rochester, Minnesota

DURING the last year a great deal of attention has been called, by other writers, to the efficacy of administering amytal (isoamylethylbarbituric acid) together with ephedrine to relieve attacks of bronchial asthma. Frequently, patients when taking ephedrine alone have complained of nervousness, palpitation, and a shaky, trembling sensation similar to the sensations following administration of the epinephrine hypodermically. It was with the hope of eliminating these sensations that amytal was suggested in combination with ephedrine. The results, after several months' study, are the basis of this report.

At first, amytal, ¾ grain (0.05 gm.), was given with ephedrine, ⅜ grain (0.025 gm.) by mouth, but later changed to amytal, 1½ grains (0.097 gm.), with ephedrine, ⅜ grain. We feel that it is safer to give first ¾ grain of amytal with ⅜ grain of ephedrine, and if no untoward effects of amytal are noted, to increase the dose to 1½ grains of amytal and ⅜ grain of ephedrine. The combination seems especially efficacious in those cases of asthma with a highly nervous background, and in which patients are troubled with attacks of asthma at night. We have had patients who, when first seen, had not had a good night's rest for weeks because of nightly attacks of asthma, and who were, as a result, fatigued, nervous, and apprehensive. This type of patient usually responds well to the combination of drugs, and is grateful for the relief which it affords. We give amytal and ephedrine to those who, by clinical history and cutaneous tests, are specifically sensitive to foreign proteins, and also to those in whose cases we can determine no allergy but the neurogenic factor seems to predominate.

We also prescribe, as a rule, Ochsner's antiasthmatic mixture to be taken in doses of 1 fluid drachm (4 c.c., 1 teaspoonful) four or five times a day for two weeks or longer. This has the combined effect of expectorant and antispasmodic. Administration of the remedies is explained to the patient as being purely for symptomatic relief and not as an attempt to cure his asthma.

Ninety-one questionnaires were sent to patients treated in this way, and answers were received from fifty-nine. Of these, thirty-one felt that they had had definite relief from the combined use of ephedrine and amytal, and many expressed positive opinions regarding the effect that amytal played in relieving the symptoms of nervousness, shakiness and sleeplessness produced by ephedrine alone. Some stated that the combination acted more quickly and relieved the attacks of asthma more completely than ephedrine alone, and others stated that the relief thus obtained was of longer duration. Eleven patients reported that they had noted little or no benefit from the combined drugs, and three stated that they felt worse from taking amytal and ephedrine. Fourteen answers were too indefinite to classify, or the patients had not taken either the ephedrine alone or ephedrine and amytal together long enough to warrant any conclusion.

All in all, the reports were encouraging, and we feel that the combination of a sedative such as amytal with ephedrine relieves the unpleasant reaction of the latter remedy and at the same time enchances the effect by adding a sedative action on the nervous system.

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Submitted for publication, September 8, 1932.

HOSPITALS IN MINNESOTA

The hospitals throughout the state are having their share, and possibly more than their share, of difficulties incident to the present unparalleled depression. Hospitals on the whole must have their beds possibly three-quarters filled in order to break even financially.

There is no question but that the average so-called private hospital in Minnesota, as elsewhere, is not meeting expenses. On the other hand the free hospitals are receiving increasing demands. Even the private hospitals have increased opportunities for free service. Some have even had to go so far as to furnish the bare necessities of life to some of the graduates of their nursing schools. Deficits have to be met by Boards of Trustees at a time when even they feel poor. The situation is not pleasant to dwell on.

Physicians are sometimes unmindful of the importance of the hospital to them in their vocation. For the most part, bearing no financial responsibilities in the running of the hospital, it becomes easy for the physician to take the hospital for granted. On the whole, however, physicians coöperate with the hospital management and are only too willing to render free medical service to members of the hospital personnel, appreciating the non-profit character of such institutions. The hospitals can count on the continued coöperation of the medical profession.

It is in this spirit of coöperation that special emphasis is given in this number of MINNESOTA MEDICINE to various hospitals throughout the state. The following information has been received in response to our invitation to hospitals in the state to submit news for publication. We trust it will be of interest to our readers.

ASBURY HOSPITAL

MINNEAPOLIS

During the summer and fall months a number of alterations were made in the Asbury hospital building whereby additional conveniences were provided for both patients and doctors. Operating room space was increased and a Westinghouse urological X-ray table was installed. An additional staff room was also provided in connection with the operating rooms.

The officers for 1933 are as follows: Staff President, Dr. R. R. Cranmer; vice president, Dr. H. F. Wiese; secretary-treasurer, Dr. A. E. Cardle; Medical Advisory Board, Dr. W. W. Moir, Dr. C. C. Kennedy, Dr. A. H. Parks, and Dr. Paul Giessler.

LYDIA A. MILLER, *Superintendent.*

BETHESDA HOSPITAL

SAINT PAUL

The new Bethesda Hospital is located on one of the highest promontories in the city of Saint Paul at Como Avenue and Capitol Boulevard, two blocks north of the Minnesota State Capitol. The exterior of the building is in keeping with the times. The prime theory that governed the design of the building was the functions of the building. Much sunlight is needed in a hospital. This necessitated the use of larger windows and this in turn dictated the simplicity of treatment. The bulk of the building is in light buff brick with a much darker brick used in the spanerals, giving a vertical treatment. The entrance feature is made of Kasota stone with the entrance doors and vestibule of highly polished aluminum. The balance of the hospital is trimmed in stone.

The main lobby is two stories high and is treated in a very simple and dignified manner. The woodwork in the main lobby is of natural gum wood, finished without any stain whatsoever except a colorless clear lacquer for the protection of the wood, thereby maintaining and revealing the natural beauties inherent in the wood. Over the door leading into the main wing has been carved this inscription, "God is our refuge and strength, a very present help in trouble." The floor is done in terrazza. Italian imported marble is used for the wainscoting to the height of four feet. The ceiling is adorned in the center by one huge lighting fixture which has been especially designed for this room and carries out the simplicity of this room, at the same time adding a great deal of richness. The lighting fixture is made of nickled silver with imported amber tinted glass and projects down from the ceiling with numerous plate glass disks encircling the hanger. The room has been beautifully furnished with comfortable furniture, not in a stereotyped manner found in most hospital lobbies. Here in this lobby will be found comfortable davenports with end tables, reading lamps, and so on, just as would be found at home.

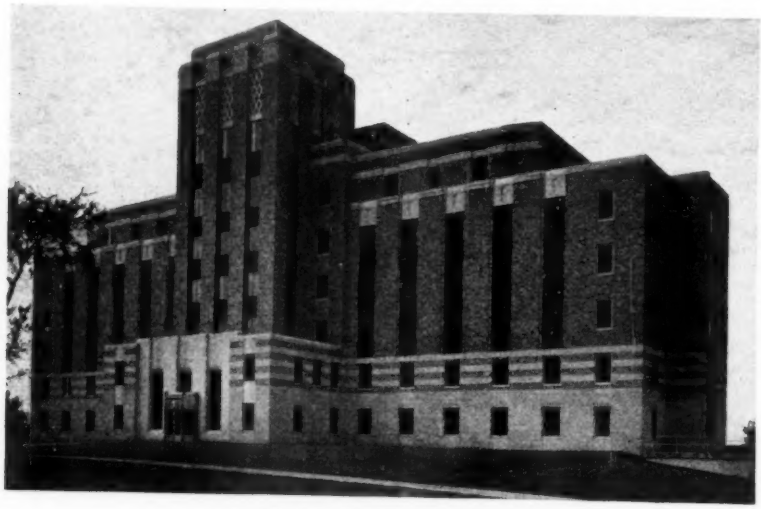
The hospital is so arranged that sometimes during the day sunshine comes into every room. The patients' rooms consist of a number of deluxe rooms, a much larger proportion of single rooms, two-bed and four-bed wards. There is room for 150 patients. Each room is planned with complete facilities for taking care of the patients, each room having in addition to its bedroom, its own private toilet and lavatory.

The thought of planning these rooms so complete was a twofold one. First, the comfort of the patient. Each patient's room is well lighted and ventilated and has for its night lighting a most modern ceiling facility and the latest type of night lighting. Each room is equipped with radio and telephone plugs in addition to the nurses' signal. Second, the convenience for the nurse. The private rooms were planned with private toilet facilities because of the easing up of the labor of the attending nurse.

The main kitchen is located in the basement and also the nurses' cafeteria, the help's dining room and staff dining room. The kitchen is located in the basement in order to facilitate the serving of food to the various dining rooms. The main floors for the patients are all served from this kitchen and are served by the use of heated food carts.

The first to fifth floor, inclusive, are patient's floors. The second floor is the obstetrical department, with the delivery rooms on the north end, there being two de-

livery rooms, with complete sterilizing and nurses' work rooms between them. This section is also equipped with sound proof labor room and a doctors' shower and rest room. The nursery has complete facilities for preparing babies' food and taking care of the other wants of the infants.



BETHESDA HOSPITAL—SAINT PAUL

THE CHILDREN'S HOSPITAL—SAINT PAUL

The sixth floor is devoted entirely to operating rooms, laboratory and X-ray departments. The operating rooms occupy a little more than half of this floor, with the X-ray and laboratory occupying the remainder of the space. The operating section is equipped with four major operating rooms and two minor operating rooms. All of the major operating rooms are equipped with the latest devices and equipment.

In connection with the equipment of the building the most modern type of doctors' in-and-out register and doctors' call system was installed. On the first floor adjacent to the lobby, but not in direct contact with the main office, the doctors have their coat room and in this coat room is the doctors' in-and-out register which they are required to punch when they come in. This in turn signals onto a board in the main office. Thus the office girls have direct knowledge of just which doctor is in the house. In connection with this is a signal system for reaching the doctor in the building for a call. Another feature is that a call may be indicated on the doctors' in-and-out register that there is a message for him at the office which he will call for as soon as he arrives at the hospital. The doctors' call system in the hospital is the silent type. Each floor and different rooms throughout the hospital are equipped with this lighting signal, which flashes the doctors' call numbers and flashes out when the doctors answer their calls. It is possible to signal for three doctors at one time.

The Bethesda Hospital is the most modern that could be conceived of at this time. No efforts and no money having been spared in making it as efficient and convenient for the sick as possible.

L. B. Benson.

THE CHILDREN'S HOSPITAL

SAINT PAUL

It has long been recognized that the health problems of children are by no means adult problems reduced to scale. Children require special treatment routine that general hospitals, unless unusually situated, cannot afford. To make possible this specialized service at a minimum cost, the Children's Hospital of Saint Paul was opened July, 1928. Since then, medical men of the Northwest have used this institution to the extent of caring for 4,344 of their difficult cases with its assistance. The patients have averaged about a ten-day stay. All admissions have been of children from birth to fifteen years of age.

The accompanying scene of happy children far away from the usual hospital surroundings gives only a partial glimpse of the institution's modern plant. Here private rooms are used for all cases during observation, in addition to having each ward bed separated by huge glass frames. Its staff room, operating facilities, oxygen tanks, biplane fluoroscopy table and X-ray machine are available at a surprisingly low cost. Routine laboratory examination is strictly followed with the results immediately available to the physician. The Children's Hospital can conveniently care for sixty patients.

A nursing school is operated by the hospital, the students being drawn from affiliated schools for a few months of pediatric work. About thirty students are enrolled.

During 1932 the Woman's Auxiliary of the hospital undertook a drive for a free bed fund. Several funds are now making the service of this hospital available to children who otherwise could not receive proper care.

Walter R. Ramsey, M.D., is medical director of the Children's Hospital. Sophie Yoerg is the superintendent.

DOUGLAS COUNTY HOSPITAL

ALEXANDRIA

The Douglas County Hospital is a fireproof structure, equipped with an electric elevator, modern operating room and equipment, portable X-ray unit, modern clinical laboratory facilities, fracture equipment, obstetrical and nursery departments with incubator. Four registered nurses are in attendance. The hospital is governed by ten directors.

The hospital has been approved by the American College of Surgeons and its staff consists of the following: Dr. E. J. Tanquist, Medical Director, General Surgery; Dr. L. M. Boyd, Eye, Ear, Nose and Throat; Dr. E. R. Sather, Gynecology and Obstetrics; Dr. A. R. Blakey, Internal Medicine; Dr. C. R. Drake (Minneapolis), Consulting Pathologist.

The hospital offers to this community hospital facilities and service on a par with the larger hospitals and has shown an increasing number of patients.

FAIRVIEW HOSPITAL

MINNEAPOLIS

The year 1930 marked the twenty-fifth anniversary of the founding of Thomas Hospital. This institution, built out of funds donated by Mr. George B. Christian, was one of the first hospitals in this part of the country devoted to the care and treatment of those suffering with tuberculosis.

DOUGLAS COUNTY HOSPITAL—ALEXANDRIA

During the twenty-seven years that have elapsed since the first patient was received, there have been more than 40,000 patients treated.

The work still goes on, concentrated and centralized in a separate pavilion of Fairview Hospital. There are thirty beds available for tuberculous patients, subject to the call of the private practitioner. Specially trained nurses are in charge of the bedside care; all necessary appliances are available and charges are moderate. Thus Thomas Hospital goes on serving and the memory of George B. Christian continues to live.

FERGUS FALLS STATE HOSPITAL

FERGUS FALLS

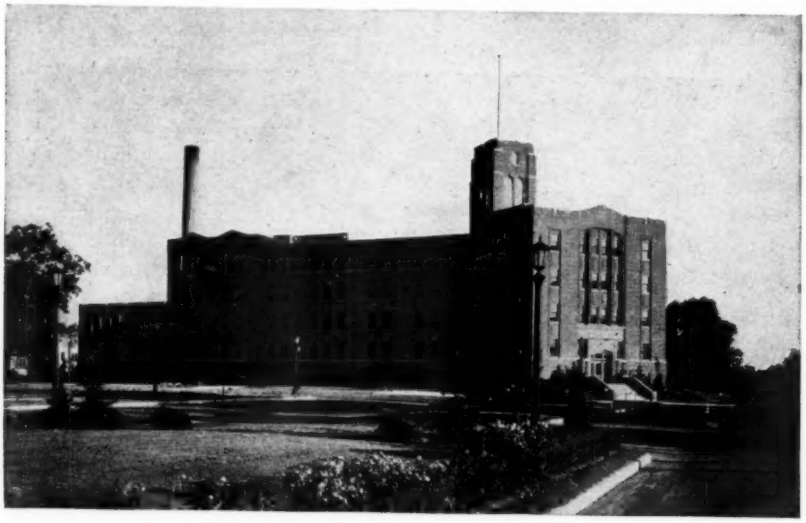
A new receiving hospital for the reception of all the new patients admitted to the institution was completed and occupied on June 1, 1932. The cost of the building, without equipment, was $135,000. It has a capacity for 102 patients—fifty of the beds are for women and fifty-two for men. It contains two twelve-bed wards, a number of rooms that will accommodate two patients each, and fifty rooms for the occupation of single patients. Patients are entered at this building for observation, examination and care. They are then classified and transferred to wards appropriate to their condition.

The building conforms to modern standards of buildings of this type. It is entirely fireproof. The Browne steel windows do away with the necessity for screens or guards. Acoustical tile has been installed in the halls and corridors in order to absorb the noise. The building is therefore much quieter than the older type of buildings. The building is two stories high with a full basement. With the exception of the halls, where rubber flooring has been installed, the floors are terrazza. A dining room is situated in the basement of the women's side. Diet kitchens are provided on both the men's and women's wards and examination rooms

properly equipped are provided for men and women.

The most modern type of hydrotherapeutic apparatus has been installed in the building in order to give therapeutic baths. The apparatus contains the most recent safety devices.

The institution has just recently installed two new motion picture machines of the most modern type with sound apparatus in the Amusement Hall. Talking pictures have now replaced the silent pictures which we have exhibited for a great many years.



MIDWAY HOSPITAL—SAINT PAUL

GLEN LAKE SANATORIUM—OAK TERRACE

W. L. Patterson, *Superintendent.*

GILLETTE STATE HOSPITAL FOR CRIPPLED CHILDREN

SAINT PAUL

During the past year changes have been made in the Isolation Department of the Gillette State Hospital in order to care for contagious diseases that develop in the hospital. New floors were laid in the rooms, and plumbing connections put in so that running water and toilet facilities are now available in each room in the contagious unit.

A new operating table, new X-ray tube, a microscope for the laboratory, and necessary surgical instruments have been added to the equipment of the hospital.

About 50 per cent of the patients admitted during the past year have come because of the after effects of anterior poliomyelitis. We can take care of them through our Physiotherapy Department, which consists of two treatment rooms, two solaria, one swimming pool, which is used for therapeutic purposes, and a treatment room in the Out-Patient Department where out-patients are treated two days a week.

The treatment rooms are equipped with tables of various widths, with splints, bakers, radiant and thermolite lamps, diathermy, stall bars, mirrors, and so on. Each solarium is fitted with four ceiling ultra violet lamps, one portable air cooled quartz lamp, and one water cooled lamp.

The anterior poliomyelitis cases are treated on alternate days in the pool and treatment rooms. All exercises in the pool are carefully supervised.

Scoliosis, poor posture, spastic paralysis, arthritis, congenital dislocation of the hips, and many other postoperative conditions are also treated in the Physiotherapy Department. A weekly lecture is given to the student nurses. The staff in this department at pres-

ent consists of three trained physiotherapists and one graduate nurse.

Patients in hospital during the past year	759
Average daily population	231
Out-patient visits	8,824
Patients receiving dental care	600

Patients eligible for treatment in this hospital are those whose parents have been residents of Minnesota for one year. The parents must be too poor to pay for hospital treatment or to pay their doctor bills, and the patients must be orthopedic cases that can be helped by hospital treatment.

ELIZABETH MCGREGOR, *Superintendent.*

GLEN LAKE SANATORIUM

OAK TERRACE

In August, 1931, the new Vocational building of the Glen Lake Sanatorium was opened. This building was given the County of Hennepin by the Citizens' Aid Society of Minneapolis in memory of Henry Hall Christian, son of the late Mr. and Mrs. George H. Christian, the founders of the Society. It provides new occupational therapy quarters, well equipped class rooms and shops for vocational academic training, and new surgical and laboratory quarters.

The Publix Theaters are donating "sound" equipment so that "talkies" may be given for the amusement of the patients. It has been almost impossible to obtain silent pictures for the last year or two, and since movies are almost universally enjoyed this gift will be most gratefully received.

Dr. Ernest S. Mariette, Superintendent and Medical Director of the Glen Lake Sanatorium, was elected president of the Mississippi Valley Conference on Tuberculosis at its annual meeting held in Indianapolis in September, 1932.

HOMEWOOD HOSPITAL

MINNEAPOLIS

Homewood Hospital, a private institution, was established under the present management in 1922. This year, in celebration of ten years of satisfactory service to the public, Homewood has completely remodeled its interior. For a twenty-five bed hospital, though small

HOMEWOOD HOSPITAL—MINNEAPOLIS

as hospitals go, the expense involved in such a procedure is no small matter.

The combined talent of interior decorators and skilled chaftsmen has given to Homewood's interior a soothing quality of especial value to its patients, most of whom fall under the nervous classification.

Homewood specializes in nervous disorders, alcoholic and drug addicts. Its continuous bath facilities plus the new technician service instituted by its enterprising manager, Mr. R. T. Raskop, this year, offer to the medical profession rare supplementary aids in difficult cases. The technician service noted will consist of a complete routine laboratory examination as patients are admitted, at no additional cost.

The hospital is located near enough to the heart of Minneapolis so that it is only a three or four minute drive to the loop. It is far enough away so that its slogan—sunny, quiet, homelike—is indeed truthful.

MIDWAY HOSPITAL

SAINT PAUL

The Midway Hospital has now been in operation a little more than six years. It is a fireproof structure four stories above the basement, and having a capacity of 115 patients. The building and its equipment are modern throughout. The cost of the building including its equipment amounted to an expenditure of $750,000, which was raised partially through subscriptions given by the Baptist people throughout the Northwest and the business men of the Midway District of Saint Paul. It covers an eight acre site with frontage on University Avenue.

The hospital is equipped for the care of all general, medical and surgical patients and has a very thoroughly equipped maternity department. In addition to its modern, up-to-date X-ray Department the hospital has a limited amount of radium for the use of the members on the medical staff.

The Midway Hospital is affiliated with the Mounds Park Sanitarium and is operated under the direction of the same members of the Board of Directors. It is an accredited hospital and recognized by the American College of Surgeons as a Class A institution.

MINNEAPOLIS GENERAL HOSPITAL

MINNEAPOLIS

Several new features have been added to the General Hospital in the past two years. Physicians who in past years have interned at the General Hospital may be interested to know that the class rooms which for many years were on the eighth floor of the Nurses' Home have been moved to the ground floor, thereby contributing greatly to the health of students in the institution who previously had to climb eight floors to these classrooms because of the inadequate elevator facilities. The new arrangement has also proved a great time saver to both teachers and students. Incidentally, the hospital gained forty-three beds for nurses in the Nurses' Home by this new arrangement.

The hospital has added a central linen room. Formerly all linen was marked for the individual stations and went directly from these stations to the laundry, from which it was again returned directly to them after being sorted in the laundry according to the individual station mark. Under the central linen room plan all linen is simply marked "Minneapolis General Hospital." Soiled linen goes directly from the stations to the laundry, but instead of waiting for this same linen to be washed and sorted and returned to them from the laundry, the stations requisition immediately from the central linen room their clean linen needs. The new plan has eliminated the waiting period on stations for the return of their laundry, has eliminated in the laundry the tedious and time consuming sorting of linen for a large number of separate stations, and finally has resulted in the saving of about $200 per month to the institution in linen issue casts.

A central sterilizing and supply room has recently been added to the General Hospital set-up. All dressings are now made in the central sterilizing and supply room instead of on the individual stations as formerly. All sterilizing, which was formerly done in the operat-

ing room suit, is now performed in this central sterilizing and supply room. All forms of sterile trays are also stocked in this central supply room, where they can be requisitioned at a moment's nation by any station. This eliminates the time-consuming process of setting up these trays on the station for the individual case and the waiting for this to go to the operating room to be sterilized and returned to them. This service has also obviated the necessity for duplicating a great number of emergency supplies on all stations, and thereby has resulted in a very considerable economy in equipment maintenance.

Probably the most outstanding contribution of the Minneapolis General Hospital to the community has been the establishment within the past year of a thirty-two bed psychopathic unit. The need of a psychopathic unit in Minneapolis has been realized for many years, and numerous plans have been formulated for the establishment of such a unit. Although the present unit is limited as to capacity, it is felt, nevertheless, that it has contributed very materially to the needs of the mentally afflicted. This unit has been staffed with nurses specially trained by postgraduate study in the care of the insane, and with attendants of similar training and experience.

CHARLES E. REMY, M.D., *Superintendent.*

MINNESOTA STATE SANATORIUM

MINNESOTA STATE SANATORIUM

AH-GWAH-CHING (CASS COUNTY)

The Minnesota State Sanatorium opened, for acceptance of patients, in December 1907, with a bed capacity for fifty patients. With the completion of the new infirmary building in March, 1932, with a maximum capacity of eighty beds at a cost of $100,000, the institution now has 350 beds for treatment of tuberculosis. These beds are all enclosedd in heated rooms, with modern service. Surgical work is referred to the University Hospital. Transportation is effected over all-weather roads by heated cars.

The State Sanatorium is the only institution, for the care of tuberculosis, under the administration of the State Board of Control. The law requires a uniform charge of $1.40 per day for all cases admitted. The Sanatorium has been run with this cost plus a deficit of 50 to 65 cents per day, making the total operation cost $2.00 per day. It is hoped that this deficit can be materially reduced, at the same time increasing the service to the patients during the next two years.

H. A. BURNS, M.D., *Superintendent.*

MINNESOTA COLONY FOR EPILEPTICS

CAMBRIDGE

The Minnesota Colony for Epileptics was established in 1925 for the care and treatment of epileptic patients residing in the State of Minnesota. It is located just south of Cambridge on Highway No. 5 and the Great Northern Railroad. It owns 341 acres of land, has an inmate capacity for 650 patients, and ninety-eight employees. The value of the land and buildings is $953,-878. The institution is built on the cottage plan and consists of the Administration Building, which houses the service departments, hospital wards, and wards for the younger patients. Also six cottages for inmates which house about 100 each, together with power plant, garage, root-cellar, dairy barn, piggery and horse barn. We receive patients of both sexes and all ages, although our present facilities for young children are very limited, and the Colony cannot care for

epileptics who are insane, markedly delinquent, or very low grade mentally.

At the present time we have two separate and distinct procedures for admission. The first and most commonly used is that of committing a patient to the custody of the State Board of Control as feeble minded. This is done by the Probate Court in the county in which the patient resides and is applicable to all patients having an I.Q. of .75 or below. The other method of admission is the voluntary admission of patients whose I.Q.'s are above .75. This applies to the very few patients in which no deterioration has taken place. After admission to the institution all patients are placed on the same basis. The only difference being that the voluntary patients may leave at any time they care to or may be discharged by the Superintendent, while committed cases are only released by action of the State Board of Control.

A charge of $40.00 per year, payable annually in advance is made toward support of each and every patient. This is to be paid by the relatives if they are financially able. If not, the counties must assume this payment.

D. E. McBroom, M. D., *Superintendent.*

MOUNDS PARK SANITARIUM

SAINT PAUL

The Mounds Park Sanitarium was founded in 1905 and is located on a block of ground adjacent to the beautiful Indian Mounds Park, Saint Paul. Under able leadership the efficiency of the first unit of this hospital was raised to an enviable position. Mounds Park Sanitarium was one of the first hospitals in the Northwest to be rated as a Class A institution by the American College of Surgeons. To meet the increasing needs for rooms for patients additions were made until now it has a capacity of 125 patients.

Mounds Park is a general hospital and in addition has a special department for psychiatric and nervous patients. It is operated under a Board of Directors and is organized for non-profit. It is affiliated with the Midway Hospital, and has a Training School for 105 students, which is also affiliated with the Midway Hospital.

The Mounds Park Sanitarium has an exceptional Occupational Therapy Department. During the last two years it has initiated a golf course on its beautiful grounds and in addition has facilities for croquet, horseshoe and other outdoor games for convalescent patients.

The hospital is fully equipped with every modern convenience and includes an obstetrical department in addition to its general, surgical and medical departments.

MUDCURA SANATORIUM

SHAKOPEE

Before the white man came to Minnesota, the springs of Mudcura, near Shakopee, were known as a curative agency to the Indian. After the white man came, heard the legends told of these springs, and scientifically considered their value, Mudcura as an institution began a long, useful service to patients suffering from certain diseases.

NOPEMING SANATORIUM—NOPEMING

Mudcura is more than an ordinary bath house, its hotel accommodations being superior to most sanitariums and bath houses. All the rooms are outside rooms, airy and spacious, equipped with steam heat, electric light and telephone, richly furnished throughout. The dining room and kitchen are adequate to the rest of the hotel departments. In the basement are the smoking room, billiard room, barber shop and large recreation hall.

Over the east and west porches are the two large sun parlors. These make ideal resting places for the invalid, as well as for others in inclement weather, in the early spring and late fall.

The medical director and house physician who are in continual attendance require each patient to undergo a thorough physical examination before commencing the baths. Thus, contagious, infectious and other objectionable diseases are excluded. The amount and kind of exercise is also prescribed, as well as the diet. A graduate dietitian is employed. Dr. H. P. Fischer is the medical director of Mudcura Sanitarium.

NOPEMING SANATORIUM

NOPEMING

Nopeming is located eleven miles from Duluth on Highway No. 1. The sanatorium is the St. Louis County sanatorium for tuberculosis and has a capacity of 230 beds. It was opened in May, 1912, and has therefore been in operation twenty years. For the past seven years St. Mary's and St. Luke's Hospitals in Duluth have admitted tuberculosis patients in special wards, and all free patients in these departments have been under the care of the Nopeming Sanatorium staff, as are the tuberculosis clinics in the out-patient departments of these hospitals. These clinics are con-

ducted in coöperation with the Duluth City Health Department.

On the Iron Range, tuberculosis clinics are held regularly by the County Health Officer, Dr. G. J. Ferreira, and members of the Sanatorium staff.

The Sanatorium itself is operated under the general supervision of the State Board of Control, by the St. Louis County Sanatorium Commission, of which Dr. E. L. Tuohy is the president. Dr. A. T. Laird is superintendent of the Sanatorium. Other members of the medical staff are Dr. J. G. Lamont, formerly of North Dakota, Assistant Medical Director, Dr. J. J. Rouse and Dr. G. A. Hedberg. Dr. R. M. Mayne has immediate charge of the patients in the Duluth hospitals.

Nopeming Sanatorium has been approved by the American College of Surgeons and by the American Medical Association for residency in tuberculosis as a specialty.

During the year the Nopeming water supply has been improved and now the water used is obtained from Lake Superior through Duluth City mains.

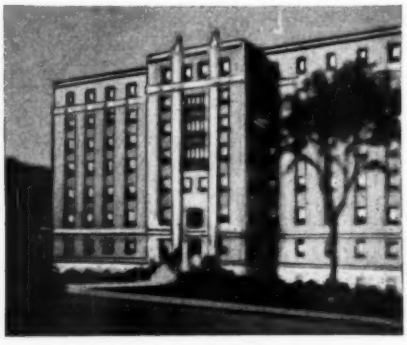
A new service building was completed in 1931.

A. T. LAIRD, M.D., *Superintendent.*

NORTHWESTERN HOSPITAL

MINNEAPOLIS

The Northwestern Hospital celebrated its Fiftieth Anniversary on November 22, 1932. Approximately 1,000 friends and former patients attended a tea which was given at the hospital.



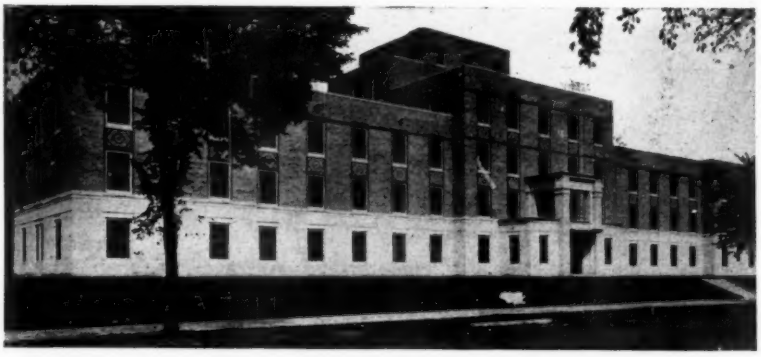
PROPOSED ST. BARNABAS HOSPITAL

While no new buildings have been erected the past year, a very large amount of money has been expended in equipment. The most important hospital event of the past year was the resignation of Mrs. Pearl Rexford, who had been connected with the hospital for approximately twelve years. Mr. Harry Brown, the new superintendent, assumed charge of the hospital in September, 1932.

ST. BARNABAS HOSPITAL

MINNEAPOLIS

St. Barnabas, as a Cottage Hospital, was founded in 1871 by the Rt. Rev. David Buell Knickerbocker, then Rector of Gethsemane Church in Minneapolis. Ten years later it became an institution of the Protestant Episcopal Church and is so maintained at the present time.



SWEDISH HOSPITAL—MINNEAPOLIS

Funds were provided for the erection of a new St. Barnabas Hospital by the late E. C. Whitney of Ottawa, Canada, in memory of his wife, who was cared for in the little Cottage Hospital, now St. Barnabas, more than fifty years ago.

The securities in which the funds were invested have so shrunk in value as to necessitate indefinite postponement in building.

The accompanying illustration is that of the proposed new St. Barnabas, plans for which were perfected in 1930.

HARRIET S. HARTRY, *Superintendent.*

ST. LUKE'S HOSPITAL

DULUTH

The following is a list of the officers of the St. Luke's Hospital staff for the year 1933:

Chief of Staff, Dr. D. E. Seashore; Vice Chief and Chairman, Program Committee, Dr. Gage Clement; Secretary, Dr. Gordon C. MacRae; Chief—Surgery, Dr. A. E. Olson; Chief—Medicine, Dr. C. M. Smith; Chief—General Medicine, Dr. Robert Nelson; Chief—Obstetrics, Dr. Robert Forbes; Chief—Pediatrics, Dr. R. E. Nutting; Chief—Ear, Eye, Nose and Throat, Dr. A. G. Athens.

JAMES MCNEE, *Superintendent.*

SWEDISH HOSPITAL

MINNEAPOLIS

The Swedish Hospital of Minneapolis is a modern general hospital with a capacity of 300 beds, seven operating rooms, fully equipped clinical laboratories, radium and X-ray service. The new building, erected in 1928, contains every modern equipment for good medical care, both in its laboratories and operating rooms, as well as its patients' rooms. It is fully accredited by

the American College of Surgeons as a Class A hospital and fully approved by the American Medical Association for internship.

The Swedish Hospital was founded in 1898 and has grown within that period from small beginnings with a capacity of twenty-five beds to a hospital occupying an entire city block, surrounded by Ninth and Tenth Avenues and Seventh and Eighth Streets, with a building occupying a quarter block across the street on Tenth Avenue and Eighth Street.

The first year the hospital admitted 238 patients and during 1931 there were 6,137 patients admitted. The total number of patients since the opening of the hospital admitted is 129,133. The membership on its staff of doctors and surgeons now numbers seventy-four.

The hospital has served the sick and needy of this community in the Northwest for more than thirty-three years. It is non-profit sharing and a non-sectarian hospital founded on Christian principles by the Swedish Hospital Association thirty-three years ago.

Its splendidly equipped maternity department has enjoyed a steady patronage, an average of 800 babies being born every year. The past year shows a record of 15,439 laboratory examinations and 5,696 X-ray treatments and examinations. Radium service was rendered in 386 cases, and there were 3,728 surgical cases.

The charity work of the hospital has been extensive, especially during the last two trying years. This service has been gladly rendered and efficiently carried on through our social service department in conjunction with the Concordia Society.

Since its founding the Swedish Hospital Training School has graduated approximately 650 nurses, a force specially adapted and prepared to minister to the sick.

The officers of the Board of Trustees are Mr. E. G. Dahl, president; Mr. B. A. Lindgren, vice president; Mrs. A. M. Nordstrum, secretary; and Dr. A. E. Johnson, treasurer.

The Chief of Staff is Dr. C. A. Stewart. Mr. William Mills is the General Superintendent, and Miss Hannah Burggren, R.N., Superintendent of Nurses.

TAYLOR MEMORIAL SANATORIUM

POKEGAMA

Pokegama Sanatorium, the Northwest's private institution for tuberculosis, will operate in the future as the Taylor Memorial Sanatorium. The organization of the H. Longstreet Taylor Foundation, named after Minnesota's great crusader against tuberculosis, has just been announced. The corporation has been formed on a non-profit basis under Minnesota law by the directors of Pokegama Sanatorium. The Pokegama staff will be retained. Ten members of the medical profession from various parts of the state will serve as a board of medical advisors for the new institution.

The movement for a memorial to Dr. Taylor began shortly after his death, January 2, 1932. At that time he was planning the construction of a new nurses' home which would complete the building plan at Pokegama. Dr. Taylor founded Pokegama in 1905. The reception hospital, built on the latest approved lines for the care of tuberculosis, was finished in 1924. The Taylor Memorial Sanatorium, under the direction of Dr. F. F. Callahan, will continue to maintain a nurses' training school and a fellowship at the University of Minnesota.

PROPOSED NURSES' HOME, TAYLOR MEMORIAL SANATORIUM—POKEGAMA

The plans for a new nurses' home will be effected as soon as conditions permit. It will be a memorial to Miss A. Reba Merrill, R.N., who organized the training school and was superintendent of nurses from 1922 until her death in 1929.

The board of medical advisors consists of Dr. Charles L. Schofield, Benson; Dr. O. E. Locken, Crookston; Dr. E. L. Tuohy, Duluth; Dr. W. S. Lemon and Dr. R. M. Wilder, Rochester; Dr. R. G. Allison and Drs. W. A. O'Brien, Minneapolis; Dr. Arnold S. Anderson, Dr. L. E. Dougherty and Dr. E. K. Geer, Saint Paul.

The accompanying illustration shows the architect's plan for the proposed Reba Merrill Memorial Nurses' home at Pokegama, Minn. Facing the hospital, it forms a plaza, with the administration building and patients' cottage on either side. It will be the completing unit in Taylor Memorial Sanatorium. Ellerbe and Company of Saint Paul are the architects.

VETERANS ADMINISTRATION HOSPITAL

MINNEAPOLIS

A construction program has recently been completed at the Veterans' Administration Hospital, Minneapolis, Minnesota, involving the expenditure of approximately $132,000, which includes the erection of a new warehouse unit, wing additions to the Administration and Infirmary Buildings, and alterations to the Neurosychiatric Building.

This construction was completed under the personal supervision of Mr. C. D. Hibbard, who in addition to his duties as Manager in charge of the Hospital,

was designated by the Veterans' Administration in Washington to act as Construction Superintendent.

The new warehouse building is a four story structure, 50 by 110 foot, which was completed on August 29, 1932. Heretofore, the Hospital has been hard pressed to find floor space for storing reserve supplies and equipment which, because of the scant warehouse facilities available, overflowed the allotted limits and had to be stored in the attics of the various hospital buildings scattered over a wide area. The new warehouse affords adequate storage space with proper protection to supplies, in locations where they are readily accessible and can be handled expeditiously and economically. A root-cellar in the basement will enable the hospital to purchase perishable subsistence supplies such as vegetables and fruits in larger quantities at much better prices, thereby effecting a considerable saving.

Work on the wing additions to the Administration and Infirmary Buildings and the alterations to the Neuropsychiatric Building was completed the early part of December.

The Urological Service, formerdy located in the Infirmary Building, increased to such proportions that its former quarters were entirely inadequate in size, and it became necessary to reserve an entire building to house this activity. For this purpose the Neuropsychiatric Building has been remodeled ot provide for this service suitable laboratory, X-ray and operating room facilities, while at the same time all patients receiving treatment for this class of disability will, when the building has been fully equipped, be provided with bed space in the remodeled building. All mental patients have been transferred to the Veterans Administration Hospital at St. Cloud, Minnesota.

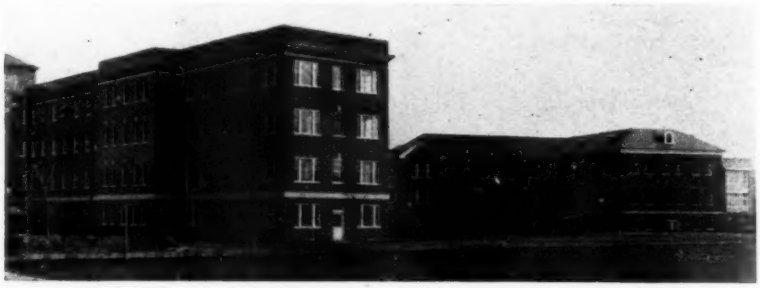
The 45 by 85 foot three story addition to the Administration Building is designed to provide room for the expansion of administration activities which have been greatly overcrowded in the past, and permit concentration of all such activities, sections of which, because of lack of space, had to be located in hospital buildings. This rearrangement will release additional space for beds in the hospital buildings.

The wing addition to the Infirmary Building, four stories high, provides, in addition to the room released by the removal of certain offices to the Administration Building, floor space for approximately ninety additional beds, including six beds for observation of nervous and mental conditions.

While all the buildings comprising the station have been in an over-crowded condition, this is particularly true of the Infirmary Building. The new addition will make possible the installation of a systematic arrangement of facilities for routing claimants through the medical clinic for physical examinations. It also provides increased clinical facilities, including a new waiting-room, showers and dressing room with individual lockers for claimants, additional examining rooms, which include a proctoscopic unit; and permit the transfer of the electrocardiograph and dark rooms from their present location to the clinic.

With the completion of this construction program, ex-servicemen are assured of a decided improvement in the service which will be rendered to them at this hospital, and the bed capacity has been increased to approximately seven hundred beds.

W. A. COLTON, *Chief Medical Officer*



VETERANS ADMINISTRATION HOSPITAL—MINNEAPOLIS

VETERANS ADMINISTRATION HOSPITAL

SAINT CLOUD

The Veterans' Administration Hospital, Saint Cloud, is one of eighteen federal neuropsychiatric hospitals, and is located on Sauk River about three miles from the city of Saint Cloud. There are, at present, 550 patients—all nervous and mental cases. These patients are sent from the states of North and South Dakota, Minnesota, Wisconsin and Iowa. At the present time there is under construction at this hospital a new building which will house approximately one hundred and seventy-five patients, and which will cost $221,021.00. In addition to the new building, porches are being constructed on the other buildings, and the Recreation Building is being doubled in size.

The staff consists of seven physicians, three consultants, one dentist, one librarian, sixteen nurses, one laboratorian, seven occupational therapy, physiotherapy and recreational aides, one dietitian, one physical director, seventeen clerical assistants, sixty-nine attendants, and sixty-seven other employees. This hospital is equipped with a splendid clinical service, dietary department, laboratory, in charge of an experienced laboratorian, X-ray laboratory, and physiotherapy department, in which all the up-to-date modalities are found.

In connection with this hospital there is a farm, consisting of about 600 acres. This gives many of the patients training in agriculture, dairying, floriculture, gardening, and so on. It is obvious that the administration of occupational therapy in a hospital of this kind is of outstanding importance, as the rehabilitation of mental patients in most instances is dependent on the administration of occupational therapy.

The library is up-to-date, and in addition to all up-to-date books the library contains some sixty different magazines and many of the larger newspapers. The recreational aide plans the various recreation activities, such as games, parties, movies, and so on. The physical director is responsible for giving such patients as are not capable of doing manual work, exercises which are conducive to building up their general health.

HANS HANSEN, M.D.
Medical Officer in Charge.

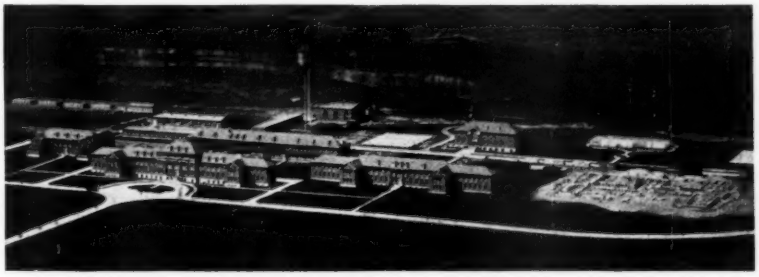
WILLMAR STATE ASYLUM

WILLMAR

This institution was established by the Legislature of 1907 as a hospital farm for inebriates. In order to provide funds for the purchase of land and the construction of buildings the act provided for the levying of a tax of 2 per cent upon all license fees for the sale of intoxicating liquor. The original institution was opened in 1912. In 1917 the act was amended to provide for the care of the chronic insane, and the same year ninety-one patients were transferred to the institution from the Fergus Falls, Rochester and St. Peter State Hospitals. In 1919, the name of the institution was changed to the Willmar State Asylum.

A charge of $10.00 a month or less is made for each patient, based upon the ability of the spouse, parent or guardian to make payment. If indigent, there is no payment. Collections are not made by the hospital, and the money, when collected, goes into the general revenue fund of the state.

The treatment of inebriates has been continued, but the larger part of the population is composed of insane persons transferred from the hospitals. Patients may be paroled when, in the opinion of the superintendent, this seems advisable. On June 30, 1932, there were on parole from this institution twenty-six insane patients and 116 inebriates.



VETERANS ADMINISTRATION HOSPITAL—SAINT CLOUD

The buildings include an administration building with two wings for patients, five cottages for men, six cottages for women, superintendent's cottage, service building and assembly hall, power house, laundry, farm buildings and cottages for the farmer and engineer.

Inmates population, 1,235; land area, 706 acres; officers and employes, 104; value of land and buildings, $1,236,149.

B. F. SMITH, M.D.
Superintendent.

N. O. Pearce, M.D.
President, Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

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Vol. XVI January, 1933 No. 1

TEACHING VALUE OF THE HOSPITAL OUT-PATIENT DEPARTMENT

The growth in both the number and capacity of hospital out-patient departments has been one of the outstanding developments of medical organization during the last decade. Throughout this period of rapid growth, the quality of service rendered has been steadily improving as the concepts of the old-fashioned dispensary have shifted towards the out-patient organization ideal of a well managed diagnostic clinic.

The teaching hospital has been particularly active in bringing about this improvement in quality; however, it is only in the last three or four years that the possibilities which the out-patient department hold for medical education have become appreciated. It is generally recognized, of course, that the average type of clinical case seen in the out-patient department is quite different from the one admitted to the hospital service and is more representative of the average physician's practice than the usual hospital case. The facts which are not generally appreciated concerning the teaching value of the out-patient department are certain elements of internal organization which should be present if the maximum effectiveness in training is to be obtained. These elements are as follows:

1. The out-patient department should be an integral part of the hospital and closely correlated with the various hospital departments. Insofar as possible the admittance, discharge, financial, laboratory and X-ray services should be fused. This facilitates the coöperation between departments which is the primary essential of any diagnostic clinic.

2. One staff member should assume responsibility for each patient. If any transfer of such authority is made, there must be no doubt as to where this responsibility is vested at all times. No matter how many consultants are called or how many laboratory tests are involved, good medical care cannot be effective either with respect to diagnosis or treatment if some one staff member does not accept the responsibility of the particular patient involved. The patient should know at all times that this is his doctor, to whom he can turn and who will evaluate for him the complex and frequently diverse opinions of consulting staff and internes.

3. Just as some one staff member is the responsible physician in charge of the patient, so one interne or student should be assigned to the patient acting in exactly the same rôle as the responsible staff physician except that the responsibility is not vested in his hands. His duties involve taking the preliminary history, making a general physical examination, ordering laboratory work, suggesting desirable consultation, and expressing a preliminary diagnosis. The training value depends very largely upon the student being able to compare his own judgment with that of a senior physician. If the staff physician does not make an independent examination and diagnosis most of the teaching value is lost.

4. If, in addition to this relationship between student, patient, and responsible staff physician, it is also possible to arrange and systematize the out-patient department so as to make it possible for the student to be present at every staff consultation on this patient and to be informed of

all events if the patient is hospitalized, then the training experience obtained from an out-patient apprenticeship can scarcely be surpassed.

It is becoming increasingly apparent that the out-patient department, which is rapidly becoming one of the major elements in medical organization and an indispensable device for handling of the ambulatory patient is also proving to be a most important adjunct to medical education.

HALBERT L. DUNN, M.D., Ph.D.
Superintendent of University Hospital.

EQUALIZING THE COST OF HOSPITALIZATION

As far back as 1926 the unequal distribution of the cost of medical care was felt to be enough of a social problem to warrant a thorough investigation in the hope of arriving at some solution. Ergo—the Committee on the Cost of Medical Care.

Among the numerous findings of the Committee was the fact that illness requiring hospitalization accounts for 50 per cent of the total costs of medical care. It was also determined that one out of every seventeen individuals, or one out of every five families, requires hospital care during the year. The average yearly cost of medical care for families with an income ranging from $2,000 to $3,000 a year was only $67.00 for those not requiring hospital care, whereas the average cost for families needing such care was $261.00.

These figures make very clear the fact that illnesses requiring hospital care were particularly burdensome to that percentage of families so unfortunate as to require hospitalization, even before the present period of depression. Any method devised to equalize this cost, which in a certain small percentage of cases is likely to prove catastrophic, should be welcomed by the public, the hospitals, and the medical profession, providing such method does not increase the total cost of this particular item in the cost of medical care, and providing, too, that the relation between the patient and his physician is not upset.

The group hospitalization plan which has made much headway in Saint Paul and which is being seriously considered in Minneapolis, the details of which were explained in an editorial in MINNESOTA MEDICINE last month, meets in part at least the requirements outlined. The hospitals are to manage the undertaking at a minimum cost of operation and without any thought of financial gain; the patient insured is undisturbed in his choice of physician, and patient and physician determine the hospital as at present.

Of course, substantially all the hospitals in any one locality must join the undertaking if the plan is to work smoothly. Selfish considerations on the part of one or more individual hospitals or individual physicians are inconceivable. The proposal, rather than being a step further toward the complete socialization of medical care, is simply the application of insurance principles to help relieve the burdensome cost of illness requiring hospitalization.

Objection has been raised that the hospital laboratory will, by means of this insurance, compete unfairly with the physicians who maintain their own laboratories. After all, if a patient can provide for this service by insurance it is a shortsighted policy to allow this consideration to bear weight in the attitude of the profession to the proposition as a whole. There is a decided need of devising some remedies for relieving the unequal costs of sickness, and there is unanimous medical opinion that ways and means should be provided in medical circles rather than by lay organizations.

Some such plan as the one proposed is a step in the right direction and County Medical Society representation in the management of the organization should prevent possible abuses from lay influence.

C. B. D.

OUR POLITICAL ACTIVITIES

The air is full of observations on taxes, bonuses, depression and economic travail. It is facetiously written, "If all the economists in the world stood hand-to-hand around the world they would not arrive at a common conclusion!" Pessimism challenges hope even where science might displace emotional expedients aimed at stabilization. "The one thing that history teaches is that it teaches nothing." Must this cynical statement ever go unchallenged?

The medical profession desires to do its utmost for society and humanity, at the same time maintaining its independence. With this in mind let us follow for a moment a few pages from the history of our railroads: A vice president of a substantial railroad recently wrote, "The railroads asked for no paternal protection—it was handed to them. Most of the fatherly protection has turned out to be stepfatherly 'don'ts'." The rails were given monopolistic domain, and with it munificent land grants. They did not have to wait long for the heavy hand of the tax gatherer, and, what was even worse, regulating discipline most exacting in degree and extent. The largess of the early period has yielded to a period of dependency, in which it looks to many that the railroads must inevitably slip into some form of public ownership and private control is nearly lost. Much railroad mileage and equipment should be junked; other forms of transportation merged or coördinated with railroading. The burden of taxation and management, competition and litigation crushingly onerous—all this in the face of an admittedly indispensable economic instrument.

Few would deny that modernized medicine is not equally indispensable. Comparatively speaking, medicine has also tended to outgrow the ca-

pacity of the public to secure its utmost possibilities without devising formulæ for public aid that immediately bring burdens of taxation and regulation that destroys effectiveness. Obsolescence in hospitals and clinical equipment, not to mention points of view, obtrude themselves, that are no easier to dispose of than the useless railroad mileage. Despite our apparent isolation other forms of promoting human acceptance and comfort intrude upon our field. In periods like the present people are finding out how well they can get along without the solace of an individual doctor.

At this critical stage we become politically minded and join up with blocs. This move may be inevitable and necessary—but it is certain that for every political advantage we may gain Providence will visit upon us a hundredfold of adversity through sharing the vicissitudes and misfortunes of "stepfatherly" politicians. This thought might well be with us at a time when the battleground of social experimentation has shifted to our commonwealth.

E. L. T.

ABUSES IN VETERAN RELIEF

There has been a decided recent change in the attitude of the public towards the policies of the Veterans' administration. The protest of the medical profession when free hospital care of veterans was extended to non-service connected disabilities, met deaf ears. Now the general policy of handing out not only hospital care but millions of the taxpayers' money to individual citizens simply because they are ex-soldiers, has made such a drain on federal resources that citizens are rightly concerned about the future.

The radio broadcast on October 26, prepared by General Frank T. Hines, Administrator of Veterans' Affairs, brought out some interesting food for thought. The Civil War veterans have cost the government some seven and a half billions. Already the World War veterans have received some six billions, exclusive of government insurance disbursements and loans on the so-called bonus. Monetary benefits are being paid to nearly one in five of those who served in the World War. General Hines estimates that the next ten years will cost an additional billion dollars "provided further liberalization of our veteran relief laws is not effected." He recommended a revision of the policies of the Veterans' Administration.

Congressional investigation now in progress should bring out the imperative need for such a revision for financial reasons and in justice to all concerned. This revision should not and need not affect compensation to those suffering disability due to service. Non-service expenditures should, however, be discontinued.

The National Economy League is doing much to crystallize public opinion and the League is being backed by the leaders of the medical profession. Now is no time for the profession to compromise with this evil of the extension of the government into the field of private practice which has been such an injustice to the private hospitals, the medical profession and taxpayers.

C. B. D.

"SPLINT 'EM WHERE THEY LIE"

It seems strange that the importance of proper ambulance equipment for rendering first aid in accident cases has not been more generally appreciated. Many practitioners carry rather complete first aid equipment in their cars so as to be prepared for emergencies. There is no excuse for police and hospital ambulances not being well equipped.

Hospitals can do much towards correcting such carelessness by insisting that proper dressing and splinting have been carried out on patients brought to their doors. The exchange of splints for those on patients admitted facilitates the maintenance of equipment in the ambulances, as brought out in an article on the subject by Dr. R. C. Webb in this issue of MINNESOTA MEDICINE. Dr. Webb lists the equipment which should be carried by an ambulance and stresses the importance of first aid, particularly in fracture cases.

Fully as important as first aid immediately following the injury is the care of the accident case on admission to the hospital. Each hospital should have an established routine for the care of the accident case which should include aseptic care and a minimum of manipulation after admission to the hospital.

DISCONTINUANCE OF PROGRESS SECTION

It has been deemed advisable by the Editing and Publishing Committee to discontinue the publication of extracts of current literature under the section title of PROGRESS. This section has been continued since the beginning of the journal with the idea of stimulating interest in the state publication, and we think has served that purpose. With the necessary limitation in the size of the journal, the elimination of this section will provide more space for the publication of articles and will facilitate their more prompt publication. After all, this section is a duplication of what is being done in other journals much better than we could ever hope to do.

We wish to take this occasion to express our appreciation of the efficient supervision of the Progress Section in recent years by Dr. L. M. Daniel. A number of members of the Association have shown an interest in their journal by submitting abstracts to this department over a period of years. This has been greatly appreciated.

PRESIDENT'S LETTER

IN THIS first message to the members of the Association I wish to express my sincere appreciation of the great honor you have accorded me. It is my earnest hope that I may have the personal friendship and assistance of each one of you in my efforts to carry on the present high standard of accomplishment for the physicians of Minnesota, as exemplified in the progress of the Association under the leadership of my predecessors.

In my mind the duties of a State Medical Association may be divided broadly into: (1) the advancement of medical science; and (2) the maintenance of sound medical economic conditions in order that a physician may, without outside interference, devote his time and thought to his professional duties and receive a reasonable compensation therefrom. A third duty, that of protecting the public in its dependence upon the profession for care in sickness, developes upon our organization of necessity. A recognition of our obligation to the public must underlie all our activities, or we shall not survive.

The first premise—that of scientific progress—lies within ourselves to accomplish and all of you have readily embraced the many opportunities afforded to amplify your knowledge and skill. We may justly take pride in the high standard of medical practice in Minnesota, and the present administration will strive to maintain and further all the facilities for medical advancement now made possible by the State and County organizations.

In the second premise—that of the economic conditions—I believe that most of us now realize that certain new forces, outside of the profession, are exerting an ever-increasing pressure which is creating new problems in ethics and economics.

We are living today in a new era in which formerly well established standards no longer retain their old significance. Among physicians any broad change in medical practive presents at once a very complex problem, and it must be solved by us in such a manner as to preserve our present high ideals of practice, or it will be solved for us by those who are interested more in the social or economic phase of the problem and who have little interest in or knowledge of the ideals and traditions of the profession. The problem of readjustment is here. We must face it squarely and devote our energy and intelligence to a sensible solution, the result of careful study and mature judgment.

I am convinced that any scheme of insurance compensation or contract practice that disturbs the intimate relationship between the family and the physician, and the faith of the family in his work, is bound to end in disaster. With this fundamental principle as our guide we shall do our utmost to bring about a satisfactory readjustment.

Yours most sincerely,

H. O. Peterson

President,
Minnesota State Medical Association.

OF GENERAL INTEREST

Dr. R. S. Laney, formerly of Oakland, California, and Browns Valley Minnesota, has assumed Dr. Borgerson's former practice at Hewitt.

Dr. Henry E. Michelson, Minneapolis, delivered the oration on syphilis before the Manitoba Medical Society at the provincial medical meeting in October, 1932.

Dr. Oscar J. Engstrand has announced the opening of offices at Chicago Avenue and Franklin, Minneapolis, for the practice of diagnosis and general surgery.

Dr. Wesley Spink, Duluth, on receiving his medical degree at Harvard in June, 1932, obtained a research fellowship at Harvard and is devoting his time to studies of blood dyscrasias.

Dr. K. A. Walfred, formerly of Cold Spring, has been named as the successor of the late Dr. O. J. R. Freed as head of the staff of the Cokato Hospital, Cokato, Minnesota, where he is now located.

Dr. Hendrie W. Grant, formerly associated with the Miller Clinic, Saint Paul, announces the opening of offices at 326 Lowry Medical Arts Building, Saint Paul, where he will continue to specialize in ophthalmology.

Dr. Richard R. Cranmer, member of the medical staff of Asbury Hospital, Minneapolis, for twenty years, has been president of the staff. Dr. Cranmer succeeds Dr. A. H. Park, who has been named to the advisory board.

Dr. Charles H. Mayo, Rochester, recently elected president of the Minnesota Public Health Association, has been appointed a member of the advisory board of the Minnesota Congress of Parents and Teachers. He will succeed Dr. J. A. Myers, Minneapolis.

Dr. A. H. Borgerson, formerly of Hewitt, Minnesota, has purchased the practice of Dr. E. A. Lodmell at Sebeka, Minnesota. Dr. Lodmell, who has received an appointment in the Army Medical Corps, left December 10, 1932, for Fort Leavenworth, Kansas, to attend the General Staff Training School.

Washington University has again placed the facilities of its clinics at the disposal of the reserve officers of the Medical Department of the United States of America. A school for inactive duty training will be held there from February 12 to 25. This is a course similar to the one held in October at the Mayo Clinic, Rochester.

Dr. Edwin Henes, Jr., of Milwaukee, has resigned as Executive Secretary of the Inter-State Postgraduate Medical Association after serving in that capacity for a period of ten years. During this period the Annual Assembly has grown to be one of the outstanding national medical meetings. Dr. Henes' duties will be taken over by members of the Board of Trustees. Registration will be supervised by Dr. Tom B. Throckmorton of Des Moines, exhibits by Dr. Arthur G. Sullivan of Madison, and publications by Dr. William B. Peck of Freeport, Illinois.

Through the collaboration of the Minnesota State Historical Society and the Highway Commission a suitable marker was dedicated on November 23, 1932, with appropriate ceremonies, at the old homestead of Dr. William Worrall Mayo at Le Sueur, Minnesota. Among the speakers were a number of acquaintances of Dr. W. W. Mayo and tribute was paid to the sterling qualities of this pioneer Minnesota physician.

Dr. W. W. Mayo, the father of Dr. William and Dr. Charles Mayo, was born in England, in March, 1819, and studied physics under John Dalton. His education was completed in this country. After serving as county commissioner in Michigan, he practiced for a short time in Saint Paul and then moved to Le Sueur. The Mayo homestead was built there in 1858.

Minnesotans will be interested to learn that Dr. Adolph Hanson of Faribault has been given the credit of having been the first to prepare a parathyroid extract. Dr. Hanson's patent to this important hormone extract was confirmed by the United States Patent Office, December 13, after a long drawn out controversy with several rival claimants. Among these were Louis Berman of New York and James B. Collip of Montreal.

The fact that Dr. Hanson is a lone investigator without backing or assistance from any great institution or medical foundation made it more difficult, no doubt, for him to establish his claim.

It is important to note, in answer to criticisms directed against patenting such medical discoveries, that many of the most useful of modern medical agents have been patented. Insulin is a conspicuous example. In this case Dr. Hanson was obliged to take his discovery through the patent courts in order to protect his process and product, as well as himself. Incidentally, a patent is the only effective protection for the public and the medical profession against the manufacture of unreliable and inferior products.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHILIP MUELLER PLEADS GUILTY TO MANSLAUGHTER

State of Minnesota *vs.* Philip Mueller

On December 16, 1932, the Honorable W. C. Leary, Judge of the District Court, sentenced Philip Mueller to a term of ten to forty years in the State Prison at Stillwater for manslaughter in the first degree. The penalty for manslaughter in the first degree is five to twenty years, but Mueller having a prior conviction for the same offense in 1912 was sentenced under the Habitual Criminal Act to a double penalty.

Mueller, seventy-one years of age, had his license to practice medicine revoked by the Minnesota State Board of Medical Examiners in December, 1930, because of his habitual indulgence in the use of morphine. Mueller continued to violate the law by maintaining an office on South Ninth Street in Minneapolis, and at the time of his arrest he was maintaining an office at 1025 Nicollet Avenue, in Minneapolis, where a sign on the door read "Dr. Philip Mueller, Medician."

Mueller was tried for manslaughter in 1931 but the jury disagreed. In the present case Mueller performed an abortion upon a twenty-four year old St. Paul woman on November 25, with death resulting on November 27. Mueller was arrested on December 7, and nine days later was received at the State Prison.

The State Board of Medical Examiners acknowledges the splendid coöperation of the County Attorney's office in Minneapolis under Mr. Goff and the County Attorney's office in Saint Paul under Mr. Kinkead; also the splendid work on the part of the Coroner's office under Dr. Ingerson and the Saint Paul Police Department under Thomas E. Dahill, Chief of Police.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

The following excerpts are selected from two of the many important papers presented at the State-wide Medical Economics meeting held under the auspices of the Minnesota State Medical Association and sponsored by the Hennepin and Ramsey County Medical Societies Sunday, December 18, in Minneapolis.

F. S. Chapin, Chairman, Department of Sociology, University of Minnesota:

"Why was this survey (of the Committee on the Costs of Medical Care) made? It was made to discover the main facts and the scope of the crisis that now faces the medical profession. As you all know, this crisis is not a mere "psychological" crisis. It is a grim, realistic situation.

"What the Committee tried to do and what it has done is to present a challenge to the American people as well as a summons to the medical profession to give an accounting! Judging by what I hear and what I have read, the medical profession appears to be aroused. I hope this is true, since, if true, it shows that you are in a healthy emotional condition. No profession or group can maintain itself in this changing world if it complacently persists in obsolete forms of social organization. All about us today is the wreckage of banks, business firms, and other enterprises whose leaders were complacent yesterday and followed outworn forms of business organization to a certain doom. . . .

"The minority report, recommending the trial of county and state medical societies as agencies of studying and planning has the merit of utilizing existing machinery. . . . But when the minority report commends a careful trial of 'method that can be rightly fitted into our present institutions and agencies without interfering with the fundamentals of medical practice,' I venture to hope that the mention of 'the fundamentals of medical practice' has reference to scientific technics, an indispensable and justifiable limitation, and does not have reference to the present organization of medical care which is far less well developed than the science of medicine. . . . If, however, the minority intended to mean that the present organization of medical care is a sacred system not to be tampered with, then I emphatically disagree. In fact, I am disposed to issue a warning. No minority is in a position to direct the course of social change to meet its own purposes, natural as such a desire is. One only needs to remind you of the importance of certain so-called master minds of big business and big politics before recent tornadoes of social force. The reasons why the choice does not rest with certain well-intentioned but misguided authorities is that, as individuals we are all helpless before certain basic social changes. . . .

"Our salvation lies in creating a social organization tough enough to resist violent changes and yet sufficiently flexible to admit of some degree of guidance and accommodation. Hence, my reason for not accepting Dr. Fishbein's contention that the report of the Committee proposes a plan that will lead to revolution. Gentlemen, the shoe is on the other foot! If an over-conservative policy of undue resistance to inevitable social changes is adopted, then indeed, you may expect a revolution about which there will be no mistake. It may be more nearly in the nature of an explosion."

From Dr. F. E. Harrington, City Health Officer, Minneapolis:

"I find no real grounds for alarm in the report of the Committee on the Costs of Medical Care. I refer, of course, to that part of the report recommending that preventive medicine become the duty of the official health agency. The administration of preventive inoculations and vaccinations is still a medical function, and it must be insisted that such administrations be at the hands of the medical personnel. If such a recommendation is considered seriously or even adopted, no community need concern themselves with it if their public health officer makes it his business to see that this function is exercised by the medical fraternity of the community.

"We hear a great deal today about the free treatment of patients able to pay in whole or in part for the care or treatment they need. As long as the medical fraternity permits public and tax supported agencies to conduct free clinics in all branches of medicine and surgery, just so long will there be the fear that persons able to pay their physician are receiving their clinical aid at the expense of the State. Until medical societies are prepared to establish and operate free or charity service for the worthy poor, public institutions must carry on this work."

OBITUARY

Le Roy Brown
1855-1932

Dr. Le Roy Brown was born February 24, 1855, at Nankin, Michigan. He was the son of Reuben J. Brown and Betsy Ann Kingsley, both of whom were descended from Revolutionary War veterans.

He attended common and high school in Michigan and was graduated from the Michigan State Normal School at Ypsilanti in 1878, after which he taught school in California for three years.

As was the custom at that time, he "read medicine" and assisted in the office of Dr. Brekke of Ann Arbor, Michigan, for a year in preparation for his work at the Medical School of the University of Michigan from 1882 to 1885, when he received his M. D. degree. He took postgraduate and hospital work at the University of Chicago. In 1886, he came to Saint Paul, Minnesota, and practiced medicine there continuously except for a few years before 1898 when he practiced at Windom, Minnesota, and then at Heron Lake, Minnesota. He served as a medical fellow at the City and County Hospital in 1898. He was associated with Dr. Schadle in the nose and throat work of the Saint Paul Free Dispensary for a number of years, and later was in charge of that department. From 1916 to 1928 he served as a police ambulance surgeon.

In 1887, Dr. Brown married Miss Mina Allen at Ann Arbor, Michigan. To this union were born three sons and three daughters, one son and two daughters surviving. Mrs. Brown died May 7, 1909.

Dr. Brown was a prominent member of the I. O. O F. and Masonic lodges, holding various offices.

He died Tuesday, November 22, 1932, after a long illness following a cerebral hemorrhage. His funeral was held at the Masonic Temple under the auspices of the Scottish Rite Masons, with Dr. Harry Noble Wilson of Central Presbyterian Church as the officiating clergyman. Interment was in Forest Cemetery.

ARTHUR J. DOHM, M.D.

Catherine A. Burnes
1849-1932

Dr. Catherine A. Burnes, eighty-three, one of the first women to get a medical degree at the University of Minnesota and the first practicing physician in Hopkins, died Saturday, December 10, 1932, at the home of her sister, Mrs. Diana B. Campbell of Hopkins.

Dr. Burnes, a resident of Hopkins since 1854 when she came there with her parents, Mr. and Mrs. George M. Burnes from Tauton, Mass., entered the University of Minnesota where she received her academic degree with the class of 1879. She later became a trained nurse and received her medical degree in 1885. Her practice at Hopkins extended over a period of thirty years.

She was an active member of the Women's Republican club of Minneapolis and the Auxiliary of the Shriners' hospital. Besides her sister, Mrs. Campbell, she is survived by a foster sister, Mrs. David C. Johnson of Great Falls, Mont.

Sheridan Grant Cobb
1862-1932

Sheridan Grant Cobb was born at Cascade, Olmsted County, Minnesota, on August 14, 1862, and died in St. Paul, of pernicious anemia, on November 18, 1932. in his seventy-first year.

He was of English ancestry and a direct descendant of one of the pilgrims who came to America in the Mayflower.

Dr. Cobb received his academic education in the Cascade township district schools and at Prof. Miles' Academy at Rochester. His medical education was gained from the Hahnemann Medical College in Chicago, from which institution he graduated in 1884, supplemented by post graduate study in the New York Polyclinic in 1894, the Chicago Clinic in 1898 and the clinics of London, Paris, Vienna and Berlin in 1900.

Dr. Cobb practiced as a student under Drs. I. N. Westphall at Watertown, S. D., and P. H. Denninger, at Faribault. After graduating from medical college he practiced at Plainview, Minnesota, from 1884 until 1889, when he located permanently at Merriam Park, St. Paul.

In 1902 he founded the Cobb Hospital which functioned until 1920 when it was taken over by the N. W. Baptist Hospital Association, in the development of the present Midway Hospital.

Because of failing health Dr. Cobb retired from active practice in 1927. He was an active Mason, having been a past master and one of the founders of Triune Lodge, the Masonic lodge of Merriam Park; a thirty-second degree Mason; a Knight Templar; a Shriner; and a patron of the Eastern Star. He was a Universalist in belief but a member, with his family, of the Olivet Congregational Church, a member of the Kiwanis Club, the American Institute of Homeopathy, the Ramsey County and Minnesota Medical Societies, and the American Medical Association.

On June 30, 1886, Dr. Cobb was married to Miss E. Melicent Cutter of St. Charles, Minnesota, who survives him. He had two children, Francis C. of New Jersey and Mary, Mrs. Geo. E. Wells, Jr., of St. Paul.

Dr. Cobb had an unusually attractive personality and enjoyed a large practice and a devoted following.

Pioneering in a virtual prairie, he played a very important part in its development into an industrial center. Starting out with a monopoly in the medical work of the district, he did not stagnate under it but was always abreast of the times. His office was exceedingly complete when very few offices were. As surgeon for the Minnesota Transfer and ten associated transcontinental railways, as well as most of the industries of the Midway district, he did much traumatic surgery and was making use of physiotherapy in the rehabilitation of these cases years before such measures were in common use. He always had some of the younger men working with him and a dozen or more successful physicians of today began their careers in his office.

For his genial personality, his ability, his industry, his vision and his devotion to the interests of Merriam Park he will long be remembered.

C. V. PAGE
S. E. STINNETTE,
H. O. SKINNER,
Chairman

Franklin A. Dodge
1862-1932

On December 6, 1932, Dr. Franklin A. Dodge, a practicing physician at Le Sueur for forty-six years and well known throughout the state for his sterling qualities, passed away.

Born at Beetown, Wisconsin, October 11, 1862, the son and grandson of physicians, Dr. Dodge received his early education in the Grant County schools. In 1880 he went to St. James, Minnesota, where he worked a short time in a drug store before taking up the study of medicine at the Minnesota College Hospital and later at the Medical School of the University of New York, where he graduated in 1886.

Opening an office at Le Sueur with his brother, Dr. William Dodge, in 1886, Dr. Franklin Dodge was active

in practice until his death. He joined the Minnesota Valley Medical Society in 1886, six years after the society was founded. Four years later the Society became the Southern Minnesota Medical Association. Dr. Dodge served as president in 1915. For twenty-seven years, from 1903 to 1930, he served as Councilor for the Fourth District of the Minnesota State Medical Association. He was also a member of the Nicollet Le Sueur County Medical Society, the Minnesota State Medical Association and the American Medical Association.

In December, 1890, Dr. Dodge married Miss Alma Poehler of Henderson, Minnesota. Of their two children, Harold and Emilie, one survives. The son died several years ago. His wife passed away last year. Of the three sisters and seven brothers, Dr. Dodge survived all but one brother, John, of Woonsocket, South Dakota.

Besides his medical affiliations, Dr. Dodge took an active part in local social and business activities. He was a member of various lodges and social organizations, having been a Mason, and was president of the Farmers' State Bank of Le Sueur.

The following reference to Dr. Dodge, the man, in the local press, well expresses the esteem in which he was held by all:

"Slow in his decisions, fair in his judgments, he was loved and respected by all who knew him. No man or woman was too humble for his kindness and consideration. Rich or poor, high or low in station to him, all men were created equal, and he showed no discrimination."

C. A. Hegge

1866-1932

Dr. C. A. Hegge, who practiced medicine in Austin, Minnesota, for thirty-six years, died Wednesday, December 14, 1932, at his home in La Feria, Texas. While living in Austin, he practiced with his brother, Dr. O. H. Hegge, both of whom are widely known in Southern Minnesota and Northern Iowa. His brother still resides in Austin. Dr. Hegge left Austin four years ago to live on a fruit ranch in Texas.

William H. Magie

1854-1932

Final rites for Dr. William H. Magie, aged seventy-eight, one of the foremost surgeons of the state, and a pioneer figure in medical circles at the Head of the Lakes who died December 11, 1932, at the Restorium after a three years' illness, were held December 13.

Born in Madison, N. J., Dr. Magie was educated at the St. Louis Medical College, St. Louis, Mo., and later took a post-graduate course at Columbia University, New York, and at Rush Medical College, Chicago. He came to Duluth in 1881 from Pittsburgh, Kan., and with Dr. S. H. Boyer, began his practice in the West End.

When the Lyceum Building was constructed, they opened offices in it, and for many years he was surgeon for all railroads, lumber and mining companies operating in that district. He served the old Saint Paul & Duluth road, the Duluth & Winnipeg road, the Duluth, Missabe & Northern, and others. Later he headed the Morgan Park Hospital for the Minnesota Steel Corporation.

Dr. Magie was one of the first staff physicians of St. Mary's Hospital, and remained a member of the staff until his death. He made medical history in the early days of Duluth, and from records at St. Mary's Hospital, performed the operation for the first properly diagnosed case of appendicitis in Duluth. In 1885 the records show he performed the first "gastro-enterostomy" in Duluth. He gained a wide reputation as a surgeon.

Records also show that he was an indefatigable worker and during epidemics of 1895 and 1897 he worked night and day.

Dr. Magie was a fellow of the American College of Surgeons, a member of the Western Surgical Association and the American Medical Association, and a former president of the Minnesota State Medical Association and of the St. Louis County Medical Society.

Following the death of his first wife a number of years ago, he married Miss Isabella Henry, who died three years ago. He is survived by a son and daughter, Woodbury W. Magie, Saint Paul, and Mrs. Frank Stauduhar, Duluth, children of his first marriage, and two sons, William H., Jr., and John Corbett Magie, both of Duluth, children of his second marriage; two sisters, Mrs. Aura Roderick and Mrs. Parthena Tohama, both of Pittsburgh, Kan., and two brothers, Frank L. Magie, former St. Louis County sheriff, and Alfred Magie of Pittsburgh, Kan.

Irwin A. O'Connor

1898-1932

Dr. Irwin A. O'Connor, Saint Paul physician, died Sunday night, December 25, 1932, in his home, following a week's illness.

Dr. O'Connor, thirty-four years old, was born in Marysburg, Minn., and had lived in Saint Paul for thirty years. He was graduated from the University of Minnesota Medical School in 1922. He was in private practice with offices in the Moore Building.

Dr. O'Connor was a member of Alpha Kappa Kappa, medical fraternity, the Knights of Columbus, the Ramsey County Medical Society, and the Minnesota State Medical Association. He was on the staff of St. Joseph's and Midway Hospitals. His wife, the former Anne Deegan of Saint Paul, died in March, 1930.

Dr. O'Connor is survived by his mother, Jennie M. O'Connor; a son, John, and a sister, Mrs. Inez Sitzmann, all of Saint Paul.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of January will be as follows:

January 4—Mitral Stenosis.
January 11—Carbon Monoxide Poisoning.
January 18—What is Hyperacidity?
January 25—Ovarian Tumors.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The American Association for the Study of Goiter, for the fourth time, offers Three Hundred Dollars ($300.00) as a first award, and two honorable mentions for the best three essays based upon original research work on any phase of goiter presented at their annual meeting in Memphis, Tenn., May 15, 16 and 17, 1933. It is hoped this will stimulate valuable research work, especially in regard to the basic cause of goiter.

Competing manuscripts must be in English and sub-

mitted to the Corresponding Secretary, J. R. Yung, M.D., 670 Cherry St., Terre Haute, Indiana, U. S. A., not later than April 1, 1933. Manuscripts arriving after this date will be held for the next year or returned at the author's request.

J. R. YUNG, M.D.,
Corresponding Secretary.

THE STATE MEETING

Plans for the 80th Annual Meeting of the Minnesota State Medical Association to be held at Rochester, May 22, 23, and 24, are already taking substantial form, according to members of the Committee on Scientific Assembly.

The Committee met for the first time in Saint Paul Saturday, November 26, to determine the general character of the meeting which, following the precedent set in Saint Paul last year and the trend of medical meetings everywhere, is to be confined very largely to small group sessions. The demonstrations for small groups which distinguished the Saint Paul meeting, together with three afternoons of clinics, utilizing the extraordinary facilities available in Rochester, are expected by the committee to make the 1933 meeting outstanding in the history of the Association.

The fact that seventeen out of thirty-five available spaces for commercial exhibits are already sold, as reported by Dr. E. A. Meyerding, Executive Secretary, in charge of business management of the meeting, is regarded as an interesting index of the importance of the Minnesota meeting in the minds of exhibitors. These spaces were sold within a few hours after the letters of announcement went out. The unusual interest shown by commercial firms is expected to find its counterpart in the interest of the profession itself, both locally and outside the state.

Present plans call for a series of open meetings, morning and afternoon, of the specialized societies of the state. The programs for these meetings will be arranged by the societies to be of interest to specialists and general practitioners alike. Among the societies that have already agreed to arrange programs are the Trudeau Society, Surgical Society, Heart Association, Urological Society, Northwestern Pediatric Society, Minnesota Society of Neurology and Psychiatry, and Minnesota Academy of Medicine.

The table demonstrations that featured last year's meeting will be repeated and enlarged for the 1933 meeting. They will be held between 10 and 11 A. M. Monday, Tuesday, and Wednesday. The early hours of Tuesday morning will be devoted to a symposium on Nutritional Disorders according to present plans, with general meetings, between 11:00 and 12:00, and 1:00 and 2:00 P. M., at which guest speakers will deliver their papers. Wednesday morning's program will be devoted chiefly to subjects voted upon by the membership of the Society, cards having gone out shortly after the November meeting of the Committee for all members to check.

The most frequent choices thus far indicated in the cards returned to state headquarters are for various phases of the nutritional disorders already chosen as subject of Tuesday morning's symposium; also the injection treatment of hernia. This latter and other choices will appear on Wednesday morning's program.

The clinics to be arranged for each afternoon will undoubtedly prove to be the outstanding feature of the meeting. A minimum of forty clinics will be held each day, utilizing all of the extraordinary facilities and talent available at Rochester.

A medical economics meeting at which Olin West, General Manager of the American Medical Association, and Morris Fishbein, Editor, will speak, is scheduled as usual for Monday night. Fraternity luncheons, the annual golf tournament, and the annual banquet will take the lead among social events of the three days.

The Council and the House of Delegates of the organization will begin their deliberations Sunday with the House of Delegates meeting for the first time Sunday night.

MEDICAL ECONOMICS MEETING

Called by N. O. Pearce of Minneapolis, who took office January 1 as president of the Minnesota State Medical Association, chairmen of all standing committees of the state society met at luncheon Sunday, December 18, preceding the afternoon's medical economics meeting at the Nicollet Hotel.

This meeting followed a precedent set by M. S. Henderson, retiring president, who called his committee chairmen together for monthly meetings during most of his term of office.

Each chairman outlined the work of his committee at the Sunday meeting and its plans for the coming year. Present were Dr. Pearce, presiding officer and chairman of the University Relations Committee; H. M. Johnson, Dawson, chairman of the Committee on Public Policy and Legislation; George Earl, St. Paul, chairman of the Committee on Public Health Education; T. H. Sweetser, Minneapolis, chairman of the Committee on State Health Relations; S. R. Maxeiner, Minneapolis, chairman of the Radio Committee; W. H. Hengstler, St. Paul, chairman of the Committee on Medico-Legal Affairs; F. L. Smith, Rochester, chairman of the Committee on Military Affairs; A. S. Hamilton, Minneapolis, chairman of the Historical Committee; W. L. Burnap, Fergus Falls, chairman of the Committee on Public Health Nursing; Leo Rigler, Minneapolis, chairman of the Committee on schools for Laboratory Technicians; J. S. Reynolds, Minneapolis, chairman of the Editorial Association Committee; J. O. Taft, Minneapolis, chairman of the newly formed Committee on Inter-Professional Relationship and F. R. Huxley, Faribault, second vice president of the state society.

Doctors S. B. Solhaug (chairman of the Committee on Hospitals and Medical Education), Earl, Hirschboeck (chairman of the Heart Committee), Burnap, Reynolds and Taft are this year's appointees. The Inter-Professional Relationship Committee newly created by the Council this year, is designed to foster and cement proper relationships between the medical and allied professions, particularly the profession of pharmacy.

More than 50 persons, most of them physicians from all parts of the state, attended the meeting called by M. S. Henderson, president of the Minnesota State Medical Association for Sunday, December 18, at the Nicollet Hotel, in Minneapolis, to consider the Majority and Minority Reports of the Committee on Costs of Medical Care.

The interest of everybody in the medical economic questions discussed was evidenced by the absorption with which they listened to the sixteen distinguished speakers, from 2:30 in the afternoon to nearly 10:30 that night.

The program was arranged to give expression to every informed and interested point of view. It began with a sketch of the economic activities and problems of the profession in Minnesota by E. A. Meyerding, secretary of the State Association and got under way pointedly with a direct and uncompromising exposition of the attitude toward the whole question of a University layman and sociologist, F. S. Chapin, Ph.D., chairman of the Department of Sociology of the University of Minnesota. Dr. Chapin, at the instance of the program sponsors, did not hesitate to express an opinion opposed to those of the majority of his audience and the wisdom of placing him upon the program early was evidenced in the warmth and earnestness

which characterized the expression of counter opinion by other speakers on the program.

E. H. Cary of Dallas, president of the American Medical Association, Olin West of Chicago, Secretary, and C. B. Wright, chairman of the Legislative Committee, represented the American Medical Association and its points of view which coincided substantially with the representatives who spoke for the local medical profession.

C. E. Rudolph, professor of oral anatomy at the University School of Dentistry and signer of one of the minority reports definitely favoring compulsory health insurance and a socialization of medicine was present to express the feeling of his co-signing members of the Committee on the Costs of Medical Care. The city and state departments of health, the hospital association and the University medical school were also represented. The sum total of all of the discussion successfully conveyed a picture of the conflicting opinions and problems entering into the current situation.

The complete list of speakers included Doctors E. A. Meyerding, E. H. Cary, Chapin, C. E. Rudolph, Olin West, C. B. Wright, M. S. Henderson, N. O. Pearce, R. E. Scammon, F. E. Harrington, J. A. Thabes, Sr., H. M. Johnson, L. R. Critchfield, George Earl, Theodore Sweetser, and Mr. A. M. Calvin, superintendent of the Mounds Park and Midway Hospital.

Selected representatives of the dental and hospital associations, University medical students, nurses and the Women's Auxiliary, also attended.

Meetings of the Council of the State Association and of the State Health Relations and the Public Health Education committees and the Committee chairmen preceded the afternoon meeting.

On Monday, December 19, Dr. Cary and a party of Sunday's speakers, including Dr. Meyerding, Dr. Pearce, Dr. Wright and Dr. Scammon went to Rochester to speak before a group of Southern Minnesota physicians at Plummer Hall. This meeting was a medical economics meeting, likewise arranged by Dr. Henderson to reach physicians at a distance from the Twin Cities.

RED RIVER VALLEY SOCIETY

The following officers of the Red River Valley Medical Society were elected for 1933: H. H. Hodgson, Crookston, president; O. E. Bratrud, Thief River Falls, vice president; C. L. Oppegaard, Crookston, secretary-treasurer; A. M. Smith, Thief River Falls, censor, and H. M. Blegen, Warren, and O. E. Locken, Crookston, delegates.

RICE COUNTY SOCIETY

J. M. Murdock, Faribault, president of the Rice County Medical Society, entertained the members of the society at a dinner meeting at the Hotel Faribault, Wednesday, December 14, 1932.

Following the dinner, C. N. Spratt of Minneapolis gave an illustrated lecture on "Eye Operations," and W. R. Webb, also of Minneapolis, talked on "Drainage in Appendicitis." New officers elected were: Dr. Murdock, president; M. L. Mayland, Faribault, vice president; C. J. Planske, Faribault, secretary-treasurer; Adolph M. Hanson, Faribault, delegate; F. J. Lexa, Lonsdale, alternate; Dr Mayland, S. B. Haessley, W. S. Nickerson, all of Faribault, censors, and W. H. Rumpf, Dr. Haessely of Faribault and Joseph Moses, Northfield, publicity committee. C. A. Rohrer of Waterville and R. J. Wilkowske of Nearstand were elected to membership in the society

STEARNS-BENTON SOCIETY

J J. Gelz, St. Cloud, has been elected president of the Stearns-Benton County Medical Society; Charlotte A. Stickney, St. Cloud, vice president; J. N. Libert, St. Cloud, Secretary; F. J. Schatz, St. Cloud, treasurer; J. P. McDowell, St. Cloud, delegate and C. A. Rathbun, St. Cloud. alternate.

WASHINGTON COUNTY SOCIETY

R. J. Josewsky, Stillwater, is to be 1933 president of the Washington County Medical Society. George F. Brooks, Marine-on-St. Croix, is first vice president; J. A. Poirier, Forest Lake, second vice president; E. S. Boleyn, Stillwater, secretary-treasurer; Dr. Boleyn, delegate; W. R. Humphrey, Stillwater, alternate, and J. W. Stuhr, Stillwater, censor.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of November 9, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 9, 1932. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. J. C. Litzenberg.

There were thirty-eight members present.

Minutes of the October meeting were read and approved.

There was no business meeting, and the scientific program was as follows:

A CASE OF RUPTURED KIDNEYS

DR. A. E. WILCOX: The patient was a female, aged twenty-six, who was injured in an automobile accident October 30, 1932. She was thrown through the windshield of the automobile in which she was riding when the car struck a tree stump. The patient was not completely unconscious but was dazed and in traumatic shock when she was observed immediately upon being admitted to the General Hospital Emergency Department. The following day she was transferred to Asbury Hospital, at which time she was suffering from lacerations of the head and face and general body contusions most marked on the left side. She also complained of severe pain in the left lower thoracic region and adjacent lumbar and abdominal areas.

In addition to the lacerations, the positive findings upon admission were marked tenderness and rigidity in the left loin and left upper and middle portions of the abdomen. The blood pressure was noted to be 100/40, and temperature 102°. The following morning her temperature was 100.2° and she seemed better. However, the urine showed 3+ albumin and many red blood cells. The hemoglobin was 71 per cent, erythrocytes 2,500,000, and leukocytes 22,200.

Forty-eight hours later, following a severe chill, the patient's temperature rose rapidly to 106.3°. She was given morphin and 3,000 c.c. of salt solution by hypodermoclysis, and the temperature dropped to 99.6°.

A flat plate of the abdomen was made which showed a diffuse shadow on the left side obscuring the left psoas muscle; the right, in comparison, being quite clear. A few red blood cells persisted in the urine and the local symptoms of pain, tenderness and rigidity became more marked in the left upper abdominal quadrant and through the lumbar region.

Cystoscopic examination showed normal urine from the right side, and no secretion from the left. The left ureteral opening was reddened and swollen and the mucous membrane around the opening was markedly injected and some exudate was present.

Following the cystoscopic examination the left loin was explored under spinal anesthesia. The usual curved

kidney incision was made and, upon reaching the perirenal tissues, results of marked and diffuse hemorrhage were noted. The retroperitoneal space was filled from the diaphragm down to the pelvis with coagulated blood, and when the kidney was isolated free bleeding from parenchyma was observed. The pedicle of the kidney was rapidly isolated and clamped en masse and the kidney removed.

Examination of the specimen presented shows a rupture of the lower pole and complete tearing and division of the ureteropelvic junction. The upper end of the lower portion of the ureter was not located.

Appropriate drainage was instituted and the wound was closed with through-and-through sutures. Immediately following the operation, 500 c.c. of blood was obtained from matched donors and transfusion by the citrate method instituted. A reaction with temperature of 103.8° ensued, followed by gradual recession. On the fifth postoperative day the temperature was 100.2°, pulse 104. The patient's general condition is good at the time of this report.

(Subsequent note: The patient left the hospital Dec. 1, with the wound still draining, but condition much improved.)

DISCUSSION

DR. OSCAR OWRE (Minneapolis): We encounter quite a number of these injured kidneys at the General Hospital and often the patient is in such a critical condition that cystoscopic examination cannot be performed. In these cases the intravenous administration of Skiodan assists us in making a very early diagnosis. Sometimes if the ureter is badly injured or completely severed, the urine after a short time becomes clear owing to the fact that the urine is being secreted into the tissues outside of the kidney and not into the bladder. Then if we measure the amount of urine passed it will be found to be approximately only half of the usual total with a palpable tumor mass in the loin of the injured side which increases in size and is painful on palpation. Here again the dye will be seen on X-ray films to be passing into the tissues outside the kidney.

DR. C. N. HENSEL (St. Paul) presented his Thesis entitled "Pitfalls in Cardiac Diagnosis" (to appear at a later date in MINNESOTA MEDICINE).

DR. H. L. ULRICH (Minneapolis): I wish to congratulate Dr. Hensel on his fine review of the problems of the cardiopath. Fifty per cent of the patients who come to us complaining of heart symptoms have no heart disease whatever. One of the simple rules of procedure in cases where there is true valvular defect is: if there is no response to rest and digitalis, there is some complication superimposed on the situation. In valvular defects, particularly mitral disease, one of the most common complications of this nature is hyperthyroidism. Hypothyroidism is encountered sometimes but it is not so prevalent. We have been able after years of experience to quite accurately diagnose the thyroid heart—the heart which is whipped up by a high metabolic rate. There are, however, instances in this group of certain cases that come to us in a decompensated state in which the hyperthyroid disease is overlooked and these go on to exitus in spite of our attempts at therapy. I have seen instances in which hyperthryoidism was even suspected and Lugol's administered without success. At postmortem nothing was found in the heart except some hypertrophy. The thyroid, however, showed hyperplasia or adenoma. One ought to examine the thyroid more closely in cases where there is no response to therapy, and surgery should be gravely considered in spite of the decompensation.

In the group that have valvular defect with hyperthyroidism, the differentiation is not so clear in the minds of clinicians. A goodly number are what we call the larval type. There is no other evidence of hyperthyroidism, the only evidence being a heart which may exhibit total irregularity or a rapid regular rate and in which there is no response to the usual therapy. Quite commonly there is no associated increased metabolic rate. Here careful palpation of the thyroid is indicated. One can often detect adenoma. That type of case is also a surgical problem.

The other point which Dr. Hensel made, the psychoneurotic, is a clinical problem which can only be handled by experience. Of course there are other pitfalls in the diagnosis of heart disease; I mean real heart disease, which he has not touched upon. But we arre not discussing these because they are only of academic interest.

DR. C. N. SPRATT (Minneapolis) showed moving pictures of (a) Cataract Extraction (pocket flap method); (b) Glaucoma Sclerecto-Iridodialysis; (c) Enucleation with Fat Implant; and (d) Magnet Operations.

DISCUSSION

DR. SPRATT: Dr. Brown suggested the possibility of tearing the conjunctival flap. Old people, especially those reduced in weight, may have a fragile conjunctiva. The use of the blunt forceps rather than a mouse tooth, and a round needle rather than the ordinary cutting needle, will obviate this difficulty. Should the conjunctiva be torn, enough of the flap remains to secure a strong wound. Certainly a much firmer and better apposition can be secured than by the ordinary incision made in the cornea or limbus.

It is not difficult to do this operation although it seems so from looking at the pictures. The knife is inserted in the pocket, the flap is turned up and there is perfect visibility in making counter puncture. My object in doing this operation with this flap is that the factor of safety is tremendously increased by the suture of the conjunctiva. The possibility of infection is reduced and the period of convalescence is shortened. Very few patients are kept in bed over twenty-four hours and most of them leave the hospital inside of a week.

There is slightly more bleeding with this type of operation but, due to the fact that the posterior capsule is in place, this blood is confined in the anterior chamber and is soon absorbed.

The meeting adjourned.

R. T. LAVAKE, M.D., *Secretary.*

TRANSACTIONS MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD OCTOBER 6, 1932

The President, DR. KENNETH BULKLEY, in the Chair

RETROPERITONEAL MYXOLEIOMYOMA

DR. MARTIN NORDLAND reported a case of retroperitoneal myxoleiomyoma in a man twenty-six years of age, with operation and pathological report. (Full report of this case is published in MINNESOTA MEDICINE, November, 1932, Vol. 15, page 779.)

DR. J. FRANK CORBETT recalled a case he had seen a good many years ago. The location of the tumor was lower down than the one described; it was over the lumbar vertebræ, and the predominant symptom was persistent pain in the rectum. Several proctoscopic examinations were made and nothing found, until finally some one felt the tumor. It was much more firm and hard than this one reported by Dr. Nordland. The man died and at autopsy it was found that this tumor had invaded the spinal canal. Another case, which

bears no relation to this one, occurred when Dr. Corbett was doing pathological work; it was a retroperitoneal tumor which he examined for Dr. Sweetser. On examination of sections, he was somewhat confused as to just what the tumor was. As a matter of fact, the whole thing disappeared under antisyphilitic treatment, only a part of the tumor having been removed at operation.

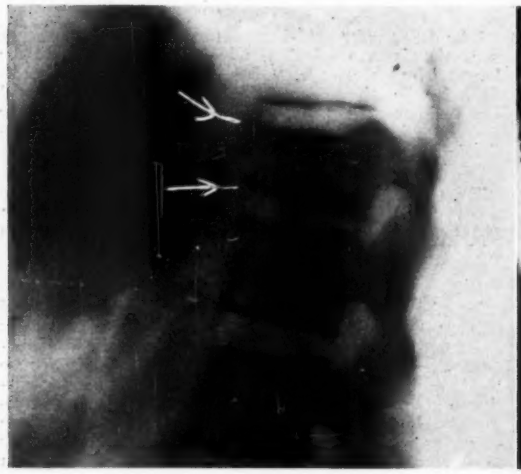

Fig. 1. Before reduction.

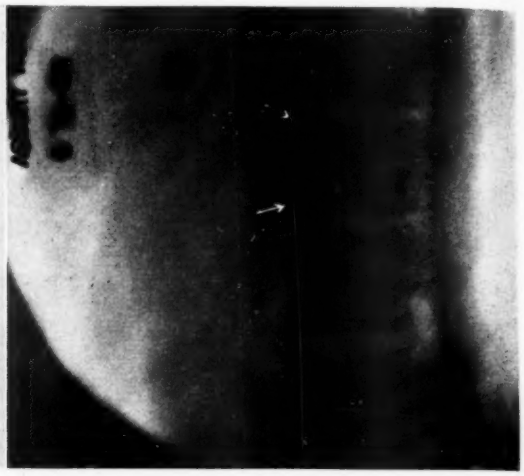

Fig. 2. After reduction.

Dr. S. H. Baxter stated that several years ago he presented before this Society a report of two cases of retroperitoneal tumor, with an analysis of about two hundred cases which, up to that time, had been reported in the literature. If Dr. Nordland had added a few more titles to the name of the tumor so as to include all the histological classes of tissue found in the body, the name would have given a composite picture of retroperitoneal tumors in general, for they are found in a region in which embryonal rests are prone to occur and in which any type of tissue may be found. In the study which Dr. Baxter had made, the vast majority of these tumors were found to be malignant, either inherently or by reason of their histological structure; or malignant in the sense that, regardless of their structure, they kill the patient by process of slow exhaustion. Diagnosis before operation is seldom made, usually for the reason, as confessed by Bettman in a paper published about the same time, that the possibility of this condition was not kept in mind. One of the cases which had been reported by Dr. Baxter was regarded as an ovarian cyst, an opinion which was concurred in by the late Dr. A. W. Abbott. This is a very common mistake, for the consistency of the tumors is such that they are semifluctuating and closely resemble the "feel" of an ovarian cyst. Aside from their interest histologically, their anatomical relations and the practical surgical problems in connection with their removal make them interesting. Lantern slides illustrating these points were shown by Dr. Baxter.

The attention of the Society was called to the collection of lantern slides which is being made by the Library of the Hennepin County Medical Society. This will be cross-indexed and made available for the use of the members of the Society. It is hoped that in time a comprehensive collection covering all phases of Medicine and Surgery will be accumulated and the members of this Society are urged to help by contributions of slides which would otherwise be lost or would be lying around in desk drawers gathering dust.

REDUCTION OF COMPRESSION FRACTURE OF BODY OF FIRST LUMBAR VERTEBRA ON A GATCH BED

Dr. R. C. Webb stated that compression fractures of the bodies of the vertebra were becoming increasingly common and that the upper lumbar vertebræ were most commonly injured. The Potter Bucky diaphragm during the past fifteen years has improved the X-ray diagnosis of these fractures and lateral view X-rays are now almost routine practice among surgeons and roentgenologists. With the standardization of the diagnostic procedures in this type of fracture it was but natural that improvements in treatment would shortly follow. Davis, of Erie, Pennsylvania, a few years ago demonstrated a method of reduction of these fractures by manipulation under anesthesia. Although Davis' method was efficacious it was considered to have possibilities of danger and it was soon followed by a method of gradual reduction over a special frame designed by Rogers of Boston. Rogers' frame was arranged so that it could be placed on the bed and flexed convexly upward under the damaged vertebra. Herzmark devised a similar Bradford type of frame which also could be flexed convexly and Conwell has modified this frame.

Dr. Webb reported the case of a man in his forties who had fallen from a sixteen-foot height and had broken both legs. There were no complaints about his back, but a careful history as to the manner of falling led him to believe that a fractured lumbar vertebra should be ruled out. A lateral view X-ray of the spine revealed a compression fracture of the first lumbar vertebra, the vertebra presenting a wedgelike appearance (Figure 1). The patient was admitted to the Asbury Hospital one week after injury and one of the fractured legs was operated upon under ether anesthesia eight days after injury. One of the legs was placed in molded plaster splints and the other was suspended in a Thomas splint with a Pearson attachment.

The problem of treatment of the fractured vertebra under these circumstances was considered and he de-

cided to place the patient in an ordinary hospital bed with the Gatch type of flexible springs such as is used by surgeons in obtaining the Fowler position for the treatment of peritonitis. On this bed the head of the spring can be elevated to elevate the patient's trunk and the remainder of the spring can be flexed upward under the knees. When the spring is lifted from the bed and reversed, the portion which flexes upward under the knees comes up under the upper lumbar vertebra.

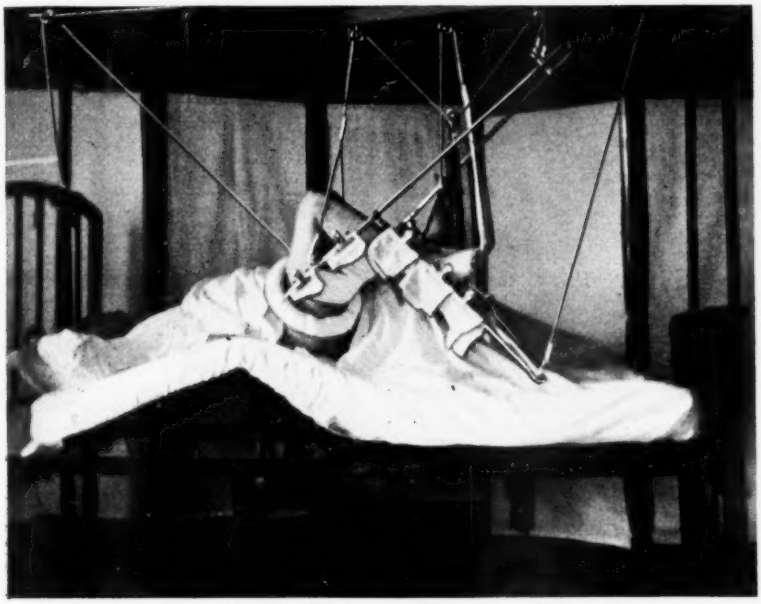

Fig. 3. Gatch bed.

When the operation on the leg was completed the anesthesia was continued until the patient was placed on this reversed Gatch bed and the spring was flexed to a height of twelve inches, which is its maximum (Figure 3). The patient remained on this bed and forty-eight hours later Miss Mary Bell, X-ray technician at the Asbury Hospital, succeeded in getting a very satisfactory lateral view of this vertebra with a portable X-ray showing the compression fracture of the first lumbar vertebra reduced, as illustrated in the X-rays shown at this time (Figure 2).

Because of the fractures in both legs the patient remained on this bed for three months with moderate elevation of the bed under his first lumbar vertebra.

Dr. E. C. Robitshek asked how long a patient should be kept in position on the Gatch bed.

Dr. Webb replied that the patient was kept at the maximum elevation for four days, at the end of which time the reduction was thought to be as near as possible to the maximum, then the elevation was decreased to about six inches and this was maintained for three months because the injured legs required three months in bed. Dr. Webb stated he had used this method of reduction and treatment on three cases and he had persuaded a colleague to use the method on a fourth patient with satisfactory results.

Dr. R. F. McGandy asked if Dr. Webb always used an anesthetic even in those patients who are able to walk in with no back complaint.

Dr. Webb stated that, with the Davis method which had been first successfully reported locally by Evans, an anesthetic was always used. He said that Rogers of Boston, who had devised the frame, used the method of gradual reduction. Dr. Webb had used the anesthetic because the patient was already anesthetized for another reason, but he saw no reason why the same effect could not be obtained gradually by following Rogers' routine and obtaining maximum elevation in about five days, using no anesthetic.

Dr. Corbett asked Dr. Webb how long a time after placing the patient in position on this bed did he obtain results.

Dr. Webb stated that his result had been demonstrated by Miss Bell with a portable X-ray machine in forty-eight hours. With the Davis method the result is obtained immediately and Rogers, with the gradual elevation without anesthesia, obtains a reduction in about five days. In the patient reported tonight the reduction treatment had not been applied until eight days after injury but this lapse of time had apparently not interfered.

RESULTS OF THE SURGICAL TREATMENT OF INGUINAL HERNIA IN MALES

Dr. H. M. Lee read his Inaugural Thesis with the above title.

SUMMARY

1. The injection method of treatment of inguinal hernia has not yet been adequately demonstrated to be as satisfactory as the surgical treatment.

2. The average rate of recurrences following surgical treatment in the indirect hernia, even in skilled hands, is probably about 5 per cent. In the direct type it would appear that the average rate of recurrences is about 15 per cent, the highest percentage of recurrences appearing in bilateral hernia done at one sitting. The percentage of recurrences in patients over sixty years of age is much higher.

3. Approximately 73 per cent of recurrences appear within nine months; practically all of the recurrences occurring within the first year.

4. Serious complications following surgical treatment

of inguinal hernia is not high, pulmonary embolism being the most serious and accounting for approximately 50 per cent of the mortality, which is reported to be approximately one-fourth of 1 per cent. In our own series we have had no pulmonary emboli and no mortality.

5. It seems desirable, as precautionary measures, to avoid too tight dressings, to have the patient avoid assuming a stationary position for too long a period; in other words, encourage early postoperative exercise.

6. The use of fascial transplants or sutures seems only infrequently necessary.

7. A well-established technic carefully and accurately followed is of distinct advantage.

DR. S. R. MAXEINER believed the subject of hernia is particularly interesting and extremely apropos. He had presented this subject previously and had referred to the work being done at the Government Hospital. At that time he had followed up something like 700 cases done for the government by Doctors Lee, Mann, Corbett, Brown and himself. But their inability to get a personal examination rendered their final examination work unsatisfactory. He was of the opinion that any statistics are practically valueless without personal follow-up examinations. They had written to these ex-soldiers, many of whom were drawing compensation on their hernias, and as a result many of them complained of various symptoms which might or might not be attributable to a recurrence.

The technic described by Dr. Lee was practically the same as that used in this series of hernia operations except that at that time they did not notch both layers of the external oblique. Dr. Maxeiner said he notched both layers of the external oblique in some cases where he thought it was indicated, but not routinely. It was also his opinion that the patient with the weak abdominal wall who has a scarcity of tissue for normal repair, especially in an obese man over 50, constitutes a class which gives a much greater percentage of recurrences. In such cases, one should consider McArthur's fascial suture or the use of a strong sac as suture or, in extreme cases, the use of the Galley fascial strip graft from the thigh. In the repair of a recurrent hernia, which ordinarily is apt to recur again in from 40 to 45 per cent of the cases, he feels that the fascial strip suture of Galley renders the best possible chance for permanent cure. Dr. Maxeiner stated that he had done three plastic repairs on hernias of this type without recurrence which he did not believe could have been made to remain permanently closed with any other method. In these instances he used wide belt lacing which was woven in by basket-weave type of suture, lacing the internal oblique and conjoined tendon to Poupart's ligament.

The Galley method should be seriously considered in all recurrent hernias, in Dr. Maxeiner's opinion. He also felt that all surgeons should review their own hernia cases to find out the character of their results, and if this should be done one would less often hear surgeons state that they had no recurrences following their herniotomies. Recurrences as a rule take place within two years of operation and the majority within the first six months following their repair.

Dr. Maxeiner again wished to congratulate Dr. Lee upon the excellent manner in which he had reviewed the subject and repaired his cases.

DR. L. H. FOWLER called attention to one thing which he felt was all-important but which had not been mentioned this evening, namely, the complete and careful enucleation and removal of the sac is the most important factor in the cure of an indirect inguinal hernia. He personally felt, if he had a hernia, that he would rather have the sac thoroughly removed without any repair or with only replacement of the external fascial layers, than he would not to have the sac thoroughly and carefully removed and have all kinds of repair of the wall. He cited the report of an English surgeon of over 1,000 cases in which the author did nothing but remove the sac and obtained just as good results as others who emphasize the repair of the wall.

DR. E. K. GREEN reported a case where paraffin had been injected in an attempt to cure an inguinal hernia, which he had seen with the late Dr. Little some years ago. The man had a large hernia and at examination the hard tumors could be felt in the tissues about the ring. At operation they found some masses one-half the size of the fist, as well as many smaller ones. So far as Dr. Green knew, the patient made a good recovery following operation. Dr. Green asked Dr. Lee his reason for the statement that he "would not advise doing a bilateral hernia at one sitting." He felt that Dr. Lee deserves a great deal of credit for the low percentage of recurrence in his cases, due largely, no doubt, to the thoroughness of his operation.

DR. R. F. MCGANDY asked Dr. Lee if in his careful review of the literature he had found the period which the patient was kept in bed after a herniotomy standardized and also whether or not this length of time in bed had any relation to recurrence.

DR. R. C. WEBB stated that two years ago, in October, 1930, he had operated upon a surgeon from another state for a bilateral inguinal hernia. This surgeon had had the courage of his convictions and had persuaded Dr. Webb to perform the operation of Russell of Australia as mentioned previously in the discussion.

The description of the operation as dictated at that time is as follows:

> "A five inch Pfannenstiel incision was made using novocaine local anesthesia and both inguinal canals were exposed. The sacs on each side were found to be about the size of a lemon but there was an additional bulging of the peritoneum just medial to the indirect hernia. The entire sacs and bulging were freed from surrounding tissues and well back into the abdomen, and were transfixed and ligated and transplanted under the internal oblique. The cords were not freed from the surrounding structures and the internal oblique and Poupart's ligament were scarcely seen and were left undisturbed. After closing the sacs the remainder of the operation consisted merely of placing a running suture in the edges of the external oblique fascia. The skin was closed with fine dermal."

The surgeon promised to report to Dr. Webb if his hernias ever recurred. It is now two years since operation and he had just recently seen him and there is no recurrence.

DR. O. W. YOERG asked Dr. Lee how long after having done a herniotomy can one expect a recurrence. He recalled a case he had operated several years ago and twelve years later the man developed a recurrence.

DR. J. F. CORBETT said in this connection he would simply repeat the advice he received as a student from his old preceptor, Dr. Rochford, *i.e.*, in oblique hernia, look out for the sac and get that; in direct hernia, you have to look after something more. One other point he wished to mention, *i.e.*, very little mention was made this evening of the ilio-inguinal nerve which sometimes gets caught in the stitches and gives a good deal of distress to the patient, probably sometimes recurrence.

DR. C. G. COTTAM felt that the question of recurrence is the outstanding worry surgeons have in these cases. He wondered if this might not be due, in part at least, to overlooking the pantaloon type, or, as Dr. Lee termed it, the saddle-bag type. He was of the opinion that this anomaly occurs more frequently than one may think. The deep epigastrics are frequently aberrant and it seemed to him a simple thing for the sac to press against the fold in which they travel and thus bisect the sac. He recalled a case of his own in which that happened. The patient was a doctor who came to him for operation and Dr. Cottam had done what he thought

at the time was a keen job. But later the other half of the pantaloon hernia was operated on elsewhere. Since then Dr. Cottam had followed the plan of putting his finger into the sac and feeling around and in some cases he has found the other part of the hernia. Lawson Tait first advocated the repair of hernia from the inside, believing that if the ring were closed and the muscle left alone the hernia would take care of itself. No one else seems to have had the courage to adopt this procedure.

The question of complications, Dr. Cottam felt, is rather a timely one. One is apt to think of a hernia as a straightforward, simple thing and it usually is. But he had had a case in a 15-year old boy who had been brought in by his doctor, and on whom Dr. Cottam had proceeded to operate in the usual manner. The reason the patient was brought in was because of tenderness; the hernia itself did not bother him so much. When Dr. Cottam operated, he found in the sac a rather acutely inflamed appendix which he easily removed, but he did not like the looks of the appendix and so had it examined bacteriologically and got a streptococcus. The boy did very well for a few days, and then developed a bronchopneumonia which was thought at the time to be due to ether. In due time this culminated in a subphrenic abscess and finally was drained. Dr. Cottam mentioned this because here was a case of an apparently simple hernia.

In connection with the injection treatment, Dr. Cottam said he had been doing surgery long enough to recall the time when injections were in the hands of quacks and he had seen quite a bit of their work. It had struck him as being rather an ideal way of getting rid of the hernia. The injection fluid usually consisted of a solution of quercus alba (white oak). In one case the hernia, which had at first been reducible, had become irreducible after the treatment, and the walls were found to be at least one-fourth of an inch thick at the operation. He had preserved the specimen from this operation and exhibited it at various medical society meetings. But Dr. Cottam felt that in proper hands there is a chance for this method to amount to something. Of course, the paraffin method is passé absolutely, but this is no reason why the injection method should be no longer used in competent hands.

Dr. Kenneth Bulkley said, in connection with the question of recurrence, that the entire matter had not been completely covered. It is quite possible that the obliquity of the conjoined tendon had something to do with the question of recurrence, particularly in direct hernia. With a heavy transversely placed conjoined tendon, the repair of the lower portion of the new posterior wall of the canal was simple. With a poorly-developed and oblique conjoined tendon, it was less easy to obtain complete coverage without tension. In such cases Dr. Bulkley had found that the method described by Blake was often of value. This consists in turning back a quadrilateral trap-door from the anterior sheath of the rectus muscle, the hinge of the door being on the outer rectus edge and the free edge of the door being used to suture to the deep reflection of Poupart's ligament.

Dr. H. M. Lee (in closing) replied to Dr. Yoerg's question, about how long a man might be safe before recurrence, that he certainly did not know. If there is anything to trauma producing hernia, a man might be subject to that at any time after an operation as well as before. Irrespective of that, there is no time, so far as Dr. Lee knew, that the man is absolutely safe from recurrence.

Dr. Fowler spoke of taking special care of the sac, and Dr. Lee was of the opinion that all surgeons attempt to do that regardless of what type of operation is performed in these cases. In answer to Dr. Green's question as to objections to doing bilateral hernias at one sitting, Dr. Lee said in the first place one is apt to use the same gloves, gowns, drapes, etc., for the second one and there is added chance of infection. Secondly, if the structures are sutured on one side there is apt to be a certain degree of tension which the unoperated side may compensate for; but if the other side is operated at the same time, of course, there is the added strain on the sutures and tissues. Then, too, the time element, exhaustion of the patient, etc., must be considered and frequently the surgeon feels that he has to hurry and probably does not do the second as thoroughly as if doing one side only at a time. Dr. McGandy asked about the period of rest in bed in its relation to recurrences. Dr. Lee said he did not know what effect that has on the recurrence rate, although he knew that some men advocated that the patient should not be kept in bed after eight days. He himself always kept the patients in bed from twelve to fourteen days postoperative.

Dr. Lee said Dr. Webb's suggestion in regard to the running suture including the transversalis fascia was a good idea; and he felt that anything that would close the incision more completely is an admirable procedure. Also, Dr. Corbett's suggestion of the nerve supply of course is of very great importance. The ilio-inguinal and ilio-hypogastric nerves are right in the field of operation, and it is very important not to injure them, not only for their innervation of the muscles; but they are also sensory to the skin in that area. Dr. Cottam's suggestion of the importance of searching for the other sac in the saddle-back type of hernia is important, and Dr. Lee said that he had done, and he also knew that Dr. Maxeiner had been doing that for a long time. He made it a routine practice to put the finger in the open sac and search for a bulge elsewhere. Dr. Lee said he thought Dr. Bulkley's suggestion of the trap door arrangement in the anterior sheath of the rectus, that is, folding this fascial flap laterally, was also a very valuable one, and while he had found it described in the literature he had never employed it. Sometimes he had thought the sutures were quite taut but so far he had had no particular trouble from this source in his cases, at least so far as he could determine.

The meeting adjourned.

F. A. Olson, M.D.,
Secretary.

IRRADIATED MILK

Enough evidence is available, from the clinical as well as the experimental field, to give assurance that rickets can be averted. To give some idea of the number of antirachitic agents at present offered, mention may be made of cod liver oil and cod liver oil concentrates, viosterol (irradiated ergosterol) irradiated products of the utmost diversity, foods fortified with viosterol, and direct ultraviolet irradiation. Obviously, it ought to be of advantage if antirachitic properties could be imparted, without attending deterioration, in a suitable degree to a few foods that enjoy widespread use, particularly in the dietary of childhood. Probably the two most universally consumed foods are bread and milk. That is why interest has begun to be centered in these products as means of antirachitic prophylaxis. Milk is of particular interest because of its unrivaled content of calcium and phosphorus—the adjuvants of a properly planned antirachitic regimen. It is gratifying to learn through a recent communication of A. F. Hess and his co-worker that fluid milk can now be successfully activated at almost insignificant cost, that it retains its antirachitic potency after drying, and that both the fluid and the dried products have been extensively tested on children with satisfactory outcome. (Jour. A. M. A., November 26, 1932, p. 1864.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE GOLD-HEADED CANE. William MacMichael, M.D. Edited with explanatory and illustrative notes and an essay on William MacMichael, M.D., by Herbert Spender Robinson. 223 pages. Illus. Price, $3.50, cloth. 1932: Froben Press, Inc., 12 Mt. Morris Park West, New York.

NON-TROPICAL SPRUE. Th. E. Hess Thaysen, M.D., Senior Physician to St. Elisabeth's Hospital, Copenhagen. 258 pages. Illus. Cloth. Copenhagen, Denmark: J. Jorgensen & Co., 1932.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES. 199 pages. Illus. Price: $1.00, cloth. Washington: Government Printing Office, 1932.

GENERAL MEDICINE. Practical Medicine Series. Edited by George H. Weaver, M.D., et al. 837 pages. Illus. Price, cloth, $3.00. Chicago, Illinois: The Year Book Publishers, Inc., 1932.

SEX TECHNIQUE IN MARRIAGE. Isabel Emslie Hutton, M.D. Foreword by Ira S. Wile, M.D., 160 pages. Illus. Price $2.00, cloth. New York City: Emerson Books, Inc., 1932.

MENTAL DEFICIENCY DUE TO BIRTH INJURIES. E. A. Doll, W. M. Phelps, and R. T. Melcher. 290 pages. New York: McMillan Co., 1932.

Detailed histories of a group of cases of infantile cerebral palsy are portrayed. The mental status in each case was elaborately determined by various tests, and the progress over a period of years is described. The use of motor re-education meets with favor in these cases, and under trained hands offers some amelioration of the dyskenesia usually present. Surgery was not attempted in this series, but is of value in a very small proportion of such cases. The study emphasizes anew the need for intelligent, conservative obstetric procedures, and for early interpretation of those symptoms in the new-born which indicate cerebral trauma.

THOMAS MYERS, M.D.

HOSPITALS AND CHILD HEALTH. A publication of the White House Conference. 279 pages. Price $2.50. New York: Century Co., 1932.

The excellent study of hospitals in relation to child health consists of three parts, devoted to a survey of children's hospitals, to convalescent homes, and to medical social service. Attention is directed to the relative scarcity of hospital beds devoted exclusively to pediatric service. On the other hand it is of interest to note that the 6,667 hospitals of the U. S., containing 905,246 beds, were only 69 per cent full in 1929. One may well wonder what the percentage will be for 1932. The inadequate experience in pediatrics during the student nurse's training is emphasized as regrettable. Similarly, nutrition workers are developed who lack clinical contacts. The desirability of the establishment of convalescent homes for adults and for children has been inadequately realized. Many cases of malnutrition, asthma, behavior disturbances, etc., respond best when treated in such an institution.

The need for adequately trained medical social service workers is emphasized. The problems with which such persons should be equipped to cope are thoroughly discussed.

THOMAS MYERS, M.D.

FOR RENT—Office in Hirsch Building, Austin, Minnesota. Formerly occupied by Doctor Coleman, eye, ear, throat specialist. Fine opening. GEORGE HIRSH.

FOR RENT—In Lowry Medical Arts Building, Saint Paul, two rooms in conjunction with two other physicians and dentist, at substantial discount. Reception room door opposite elevator. Telephone Cedar 3477 or La Salle 1182.

FOR SALE OR TRADE—This is a fine outfit that someone can have cheap. One complete X-ray equipment consisting of: One pratically new late model Acme 6:60 Transformer with controls, 220-volt, 60-cycle current; one combination horizontal and vertical radiographic and fluoroscopic Victor Table equipped to do stereo work; one Universal X-ray Timer, 110-volt, 60-cycle current; one complete dark room equipment, consisting of tank and modern accessories. Address D-203, care MINNESOTA MEDICINE.

POSITION WANTED—Efficient medical stenographer needs work. Pleasing personality. Reasonable. Excellent references. Address D-200, care MINNESOTA MEDICINE.

YOUNG LADY, twenty, wants position as doctor's office assistant. Eighteen months nurse's training and one year's experience as secretary-stenographer. Address D-199, care MINNESOTA MEDICINE.

WANTED—Young man interested in internal medicine to become associated with general surgeon in central district, Minneapolis. Complete X-ray and clinical laboratories with expert technician. Will give use of two rooms without rent to the right man while getting established. Give year of graduation; postgraduate work, if any, and previous location. Address D-204, care MINNESOTA MEDICINE.

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FOR RENT in Medical Arts Building, Minneapolis, well furnished medical offices, all morning up to 1:30 P. M. Rent $55.00 monthly, including secretary, light, telephone and gas. Address D-189, MINNESOTA MEDICINE.

THREE GENERATIONS of experience in grinding, specializing in fine surgical instruments. Prices, reasonable. Schwarz Grinding Service, Foot-Schulze Bldg., 128 10th St. E., St. Paul. Telephone, Midway 9939.